

FIG. 1

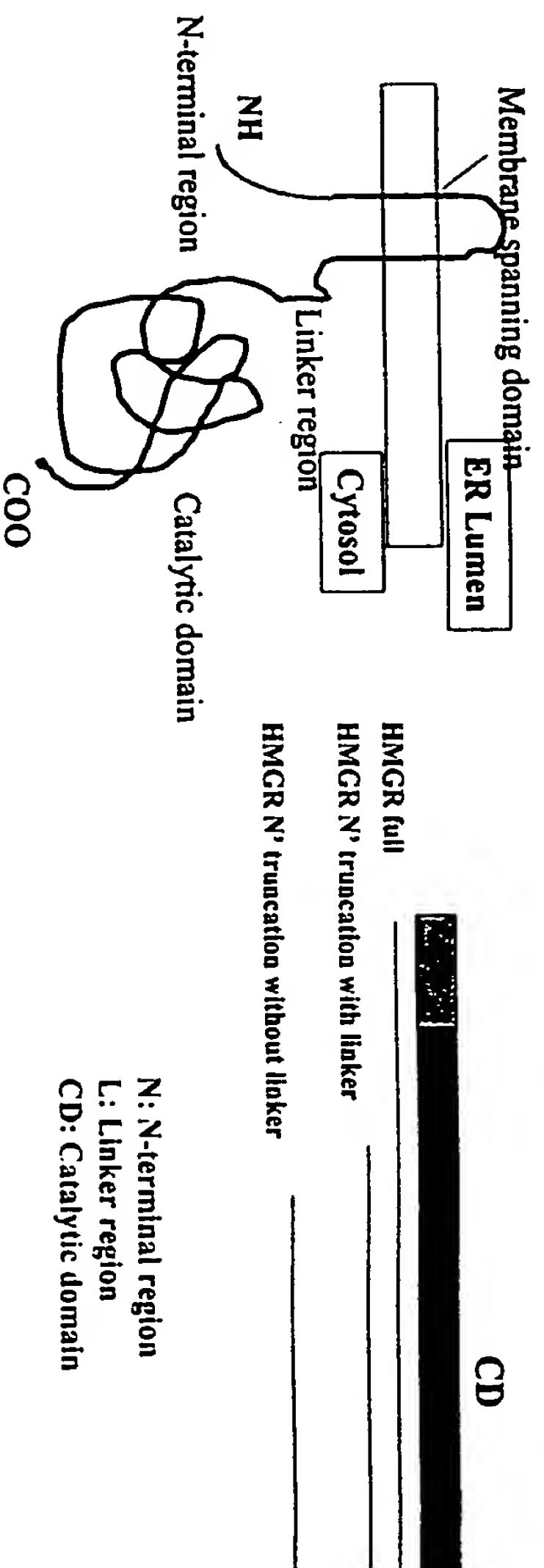


FIG. 2

Figure 3: Construct pMON29920

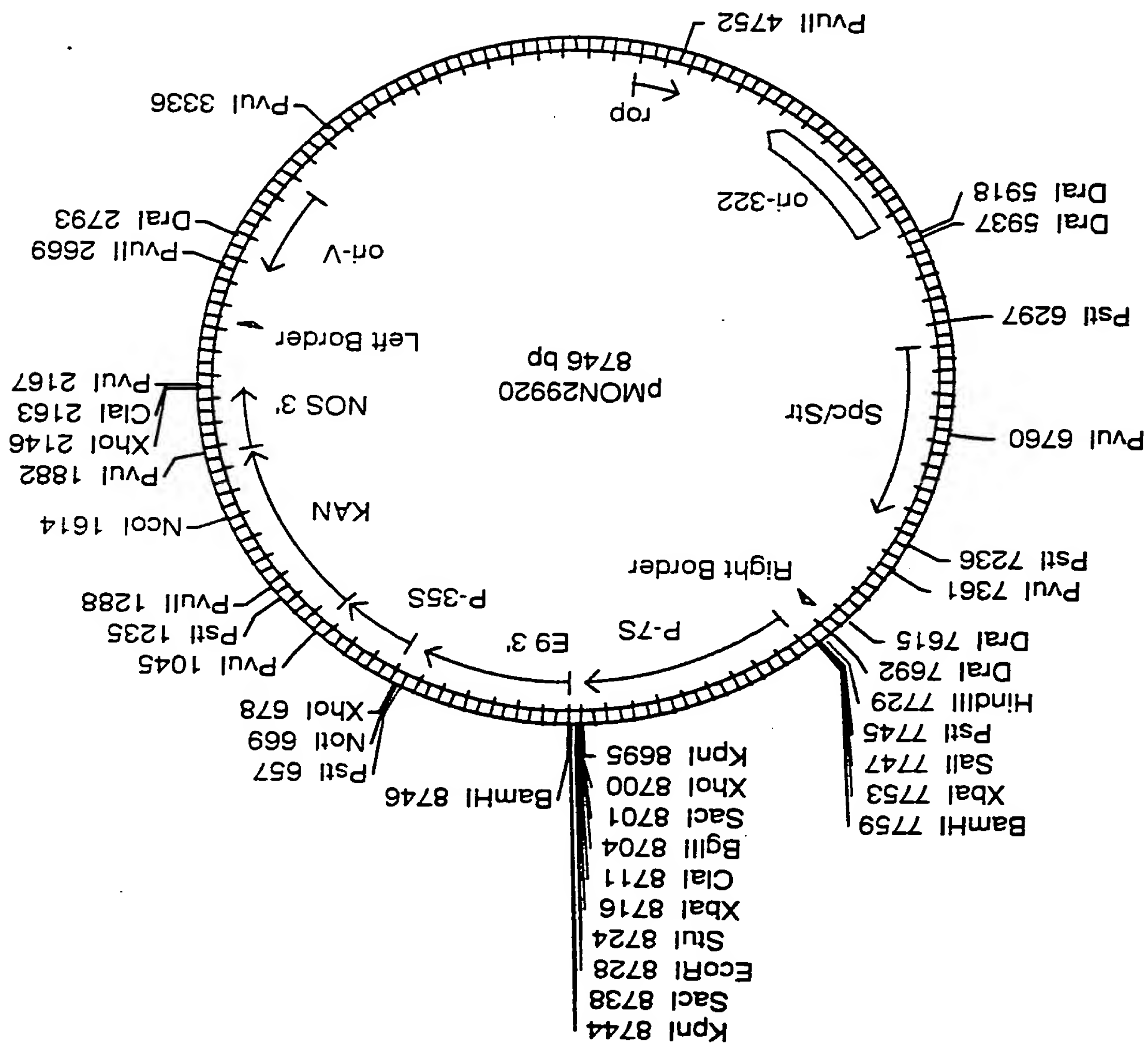
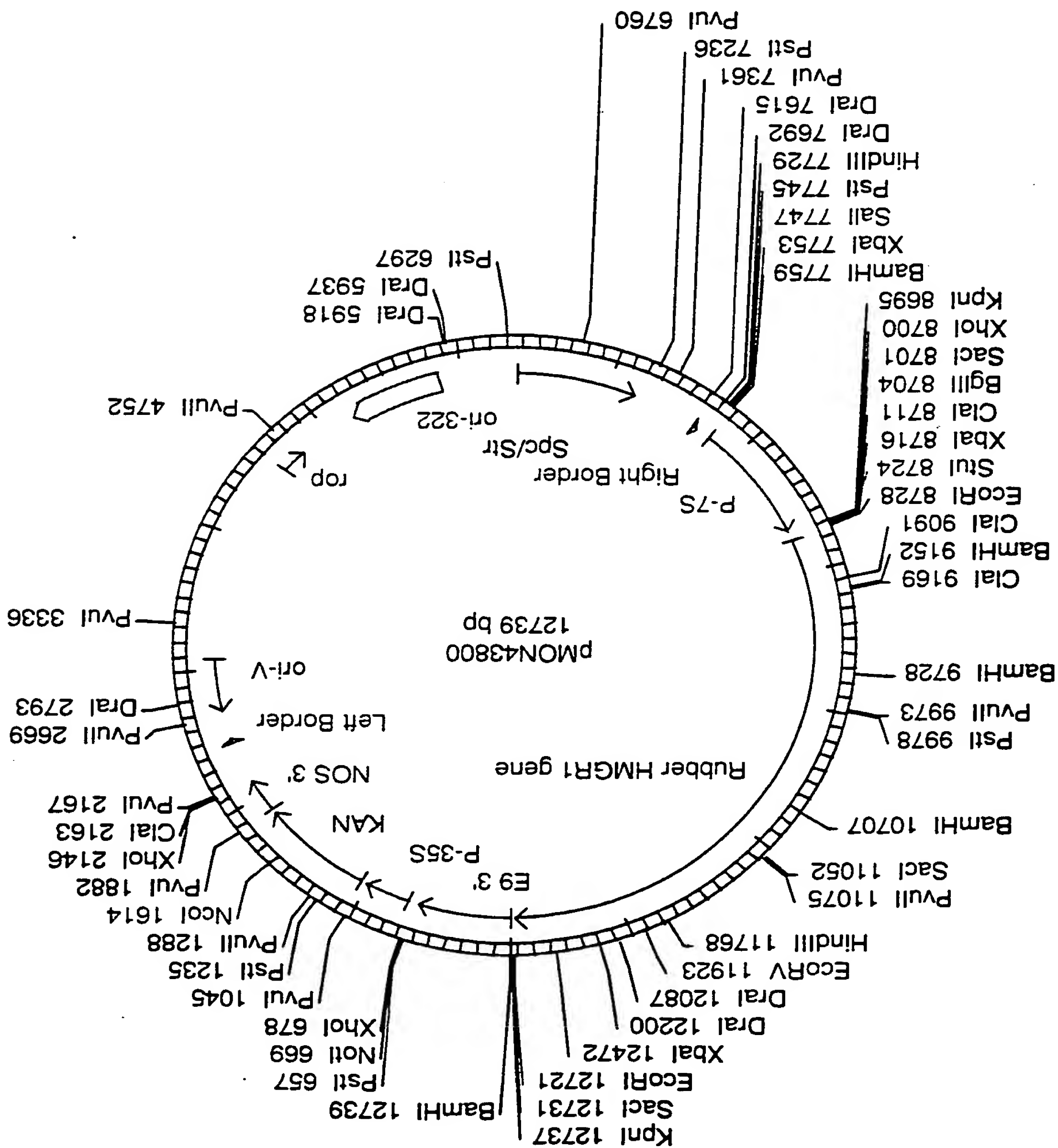


Figure 4: Construct pMON43800



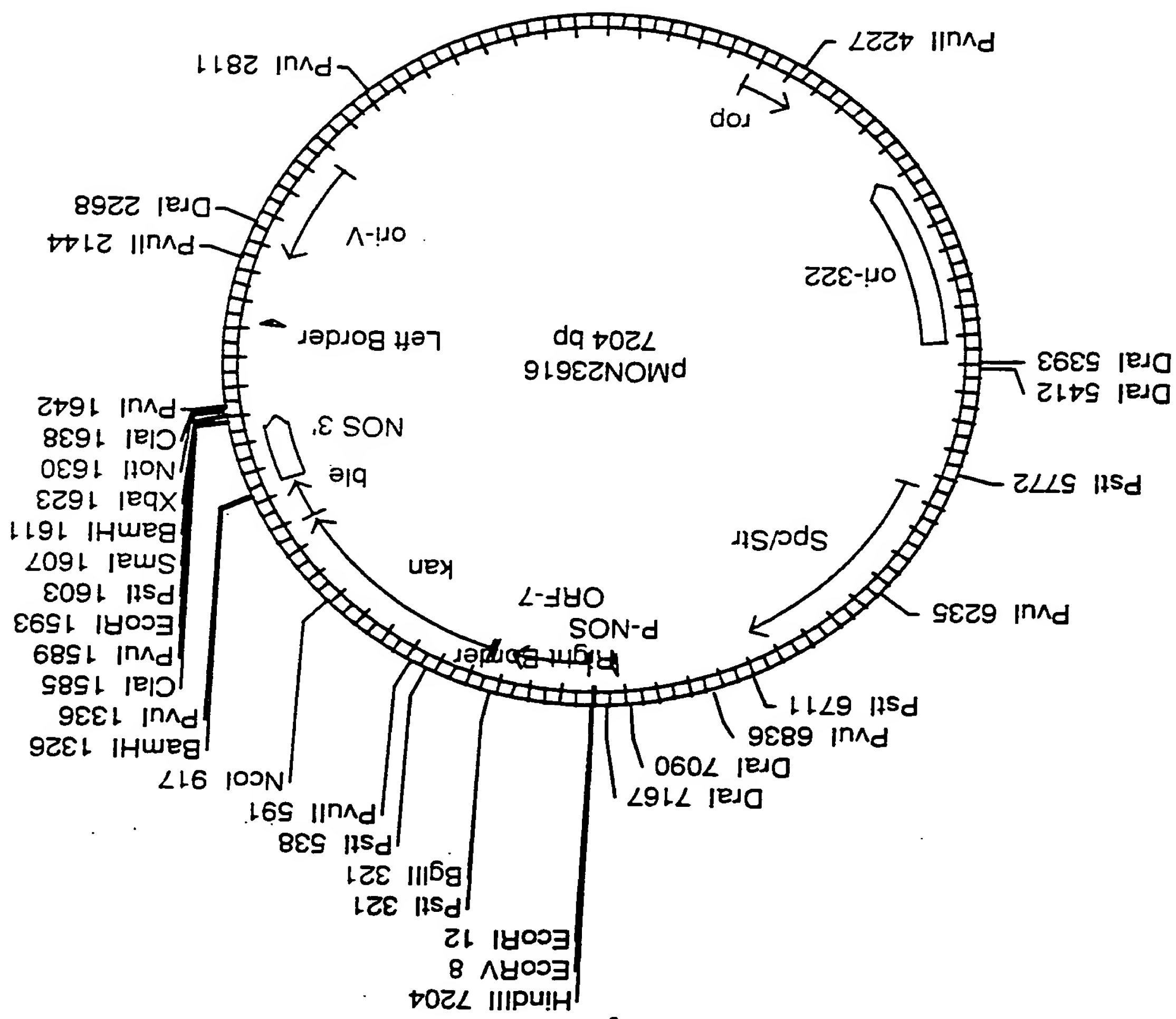
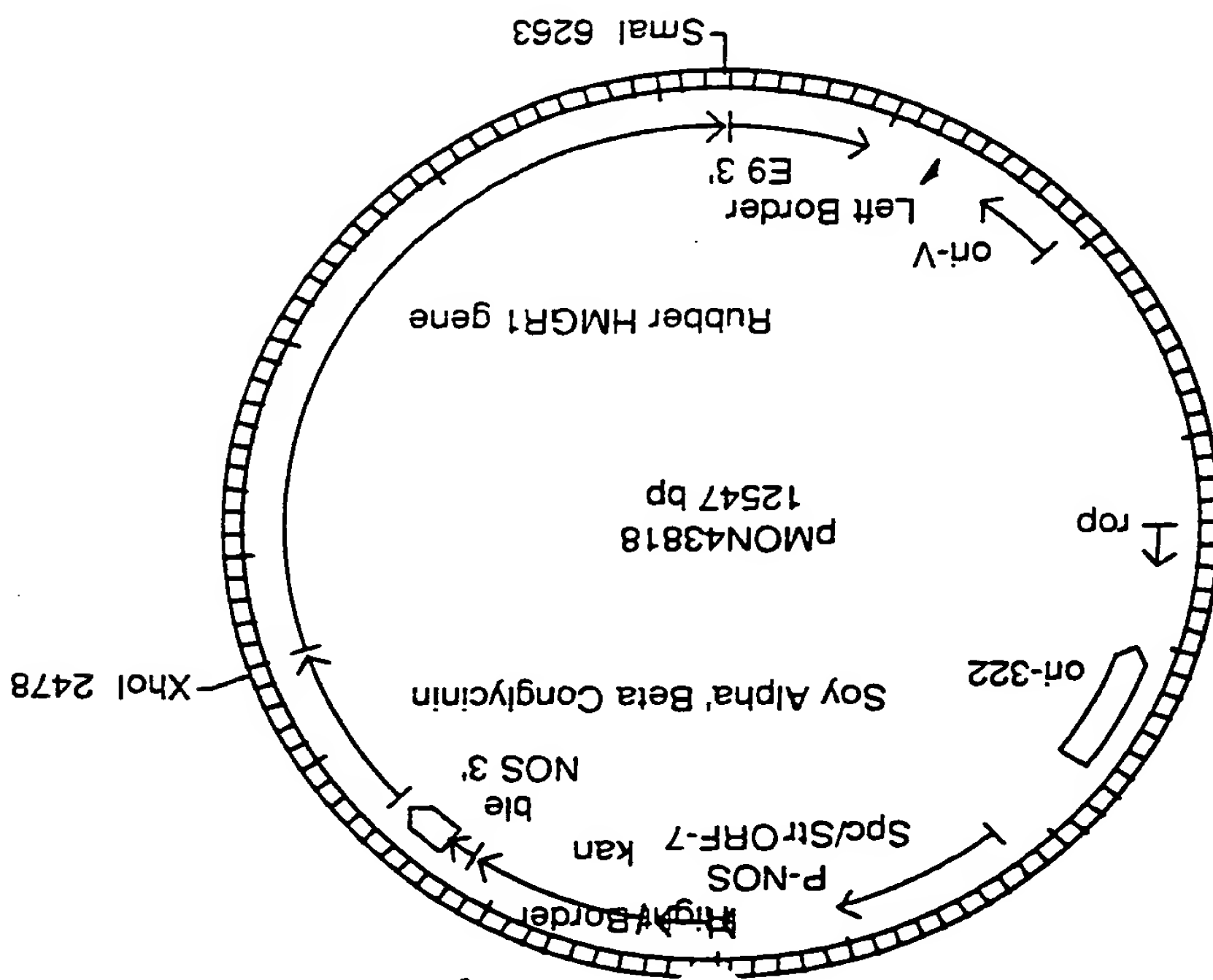


Figure 5: Construct pMON23616

Figure 6: Construct pMON43818



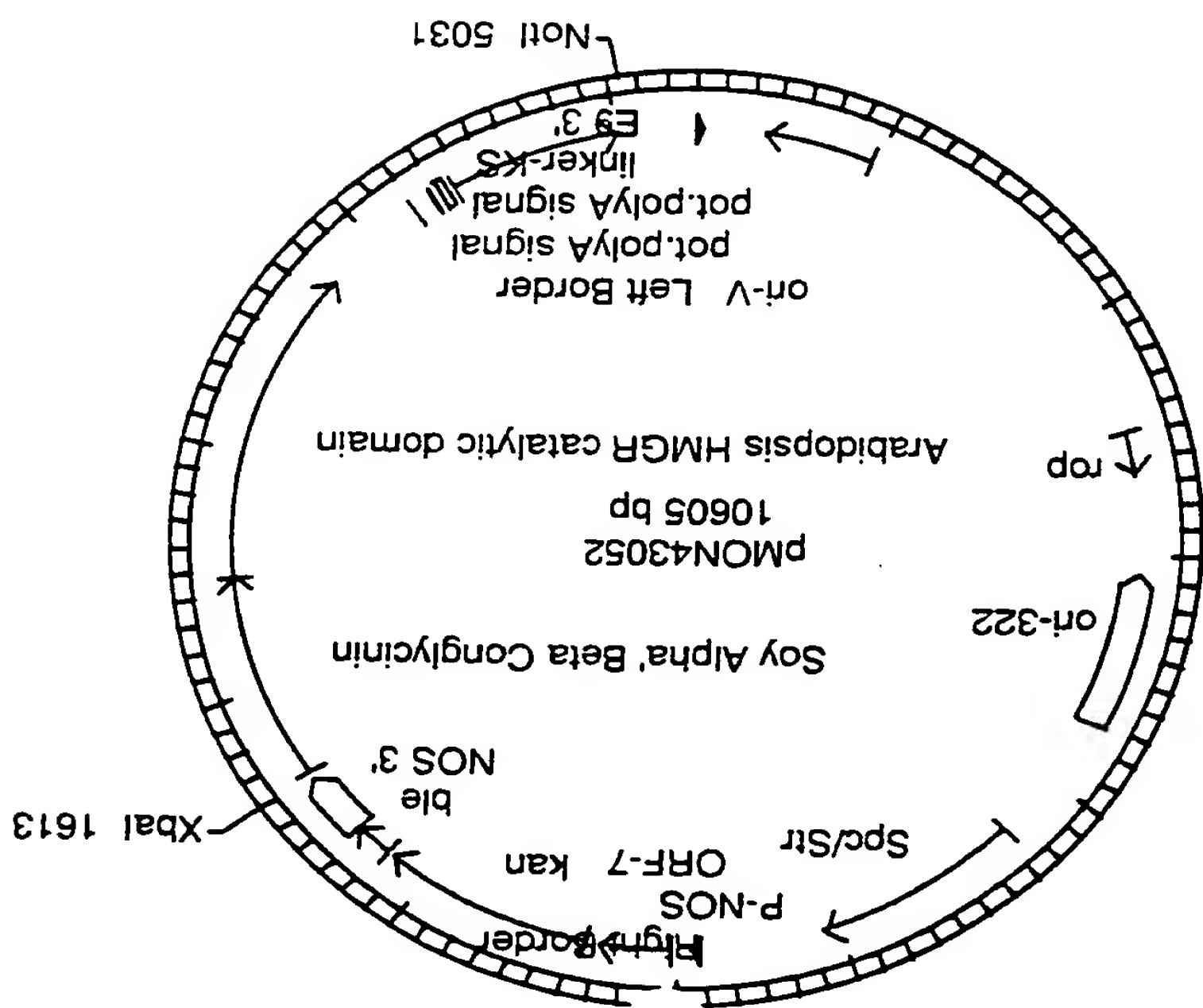


Figure 7: Construct pMON43052

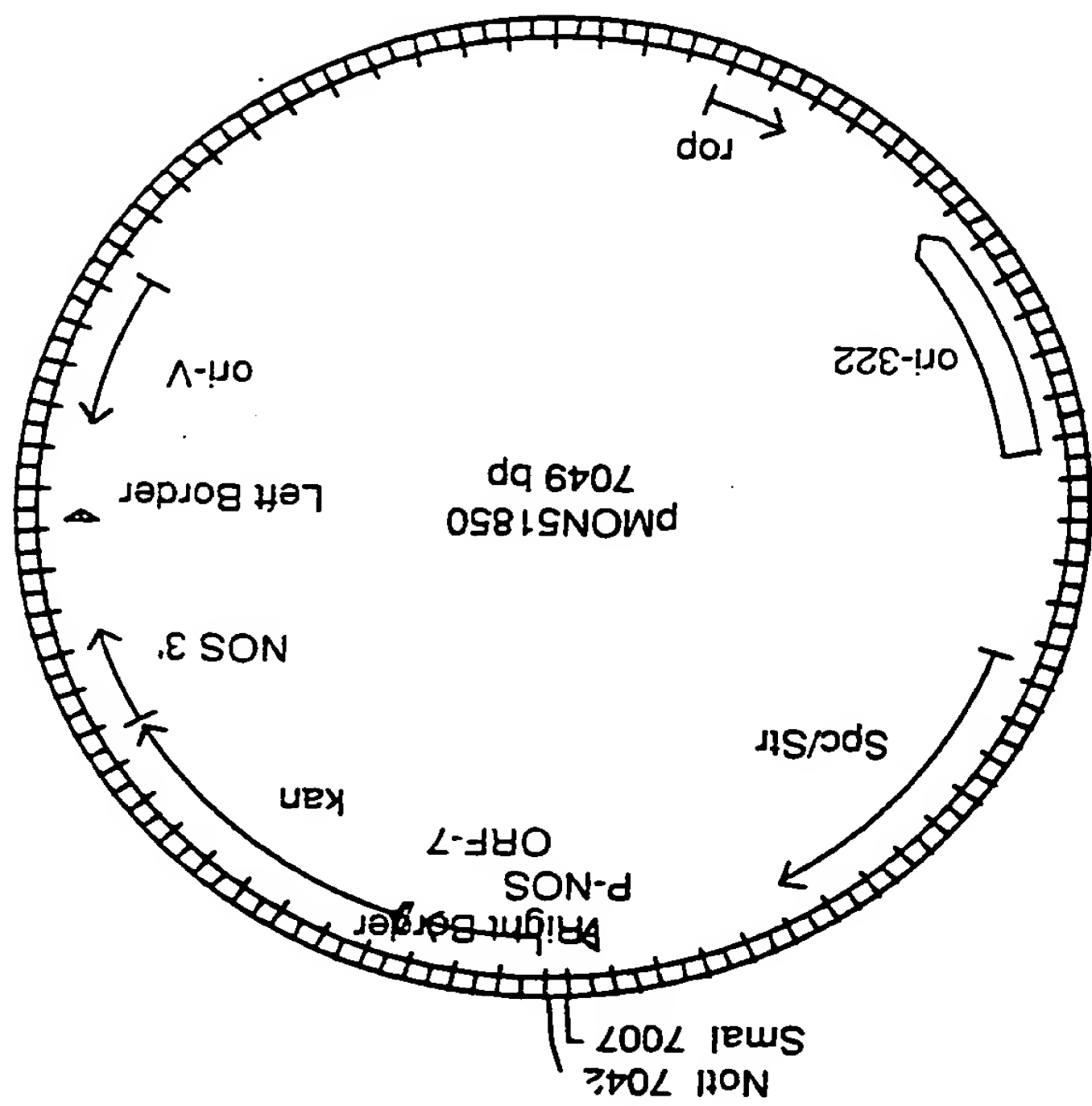


Figure 8: Construct pMON51850

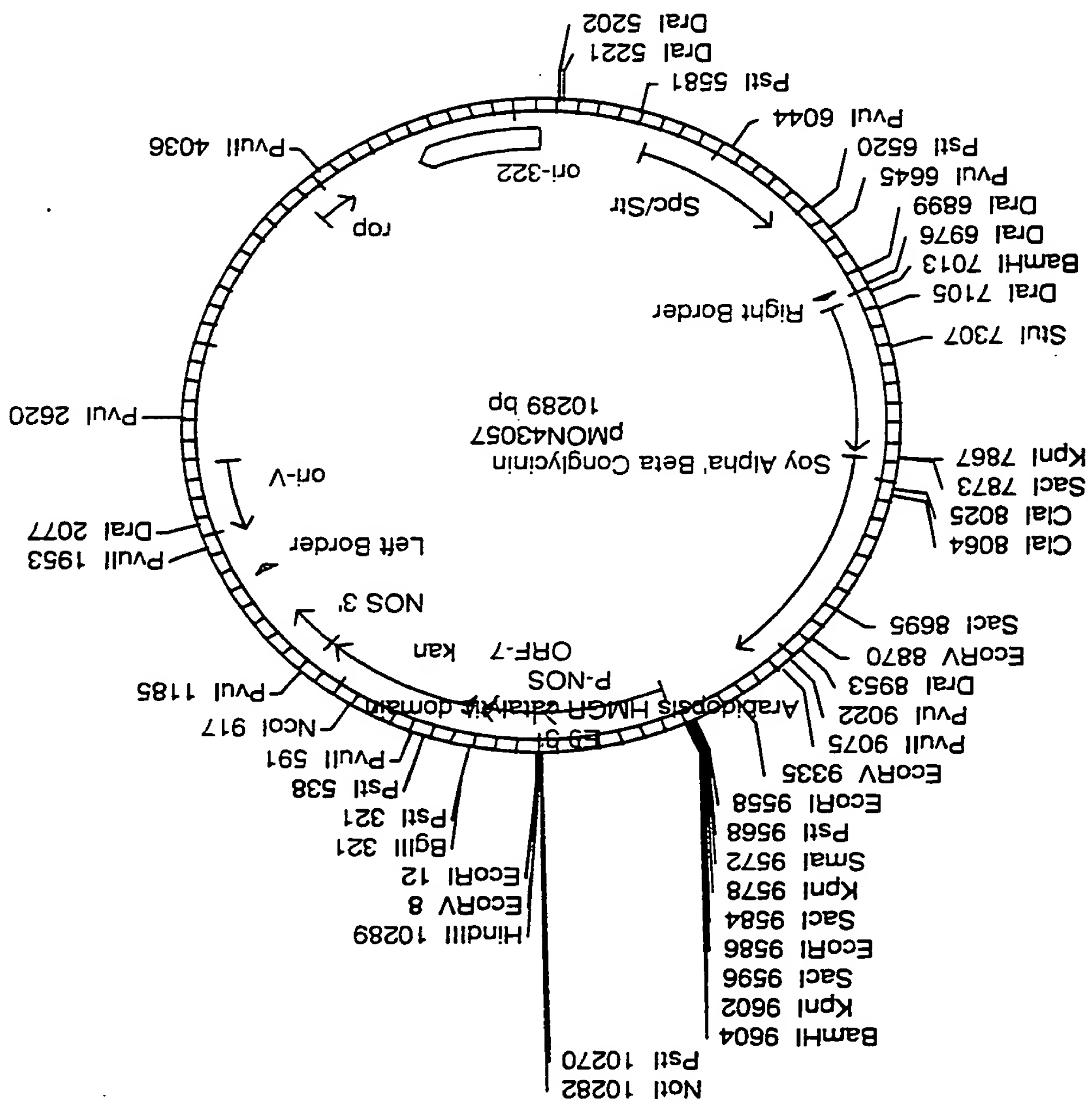


Figure 9: Construct pMON43057

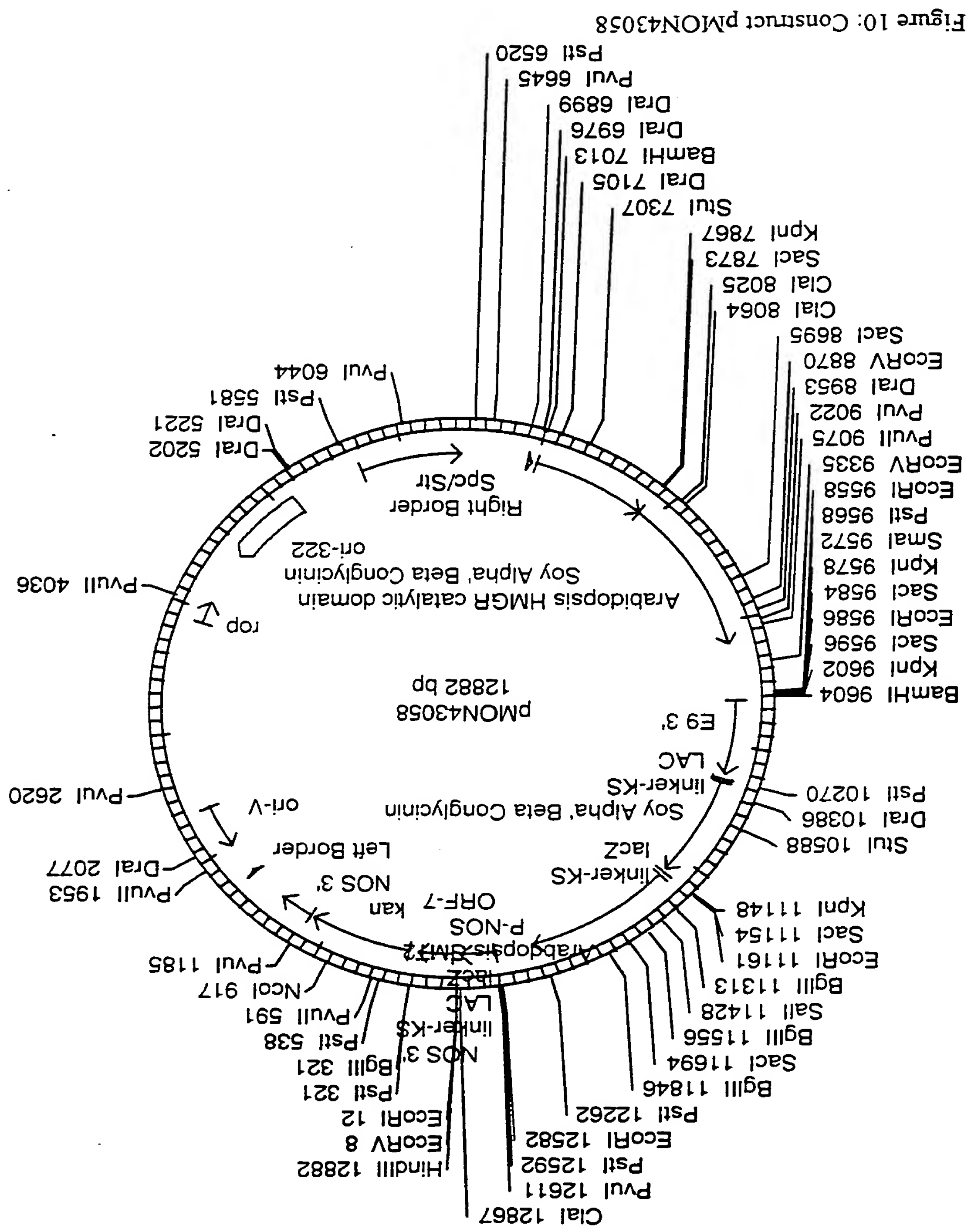


Figure 10: Construct pMON43058

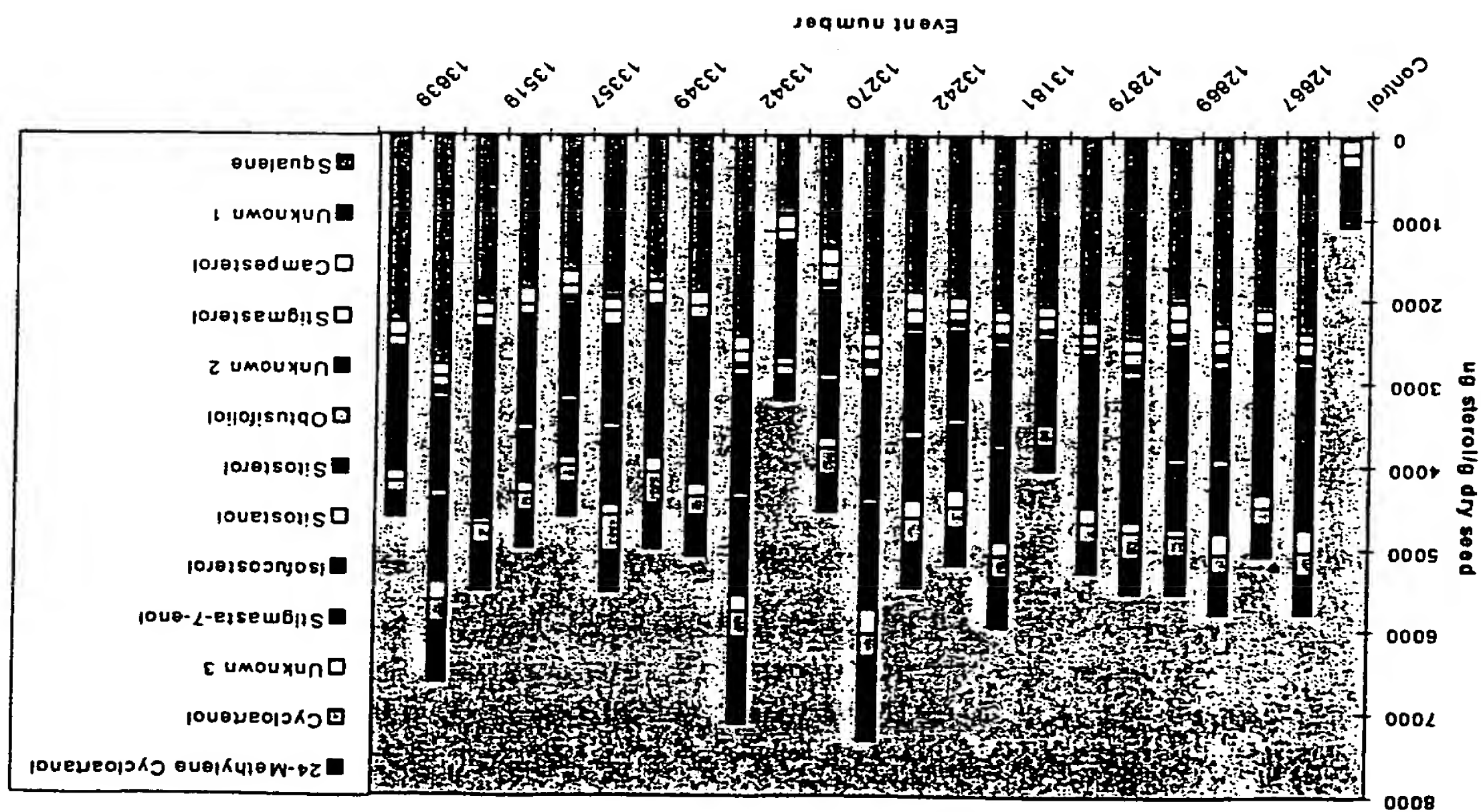


Figure 11: Sterol composition of R1 transgenic soybean seeds when *Arabidopsis* truncated HMGR (catalytic domain without linker) was overexpressed using seed-specific 7S promoter (data from pMON43057: p7s::At HMGR truncated).

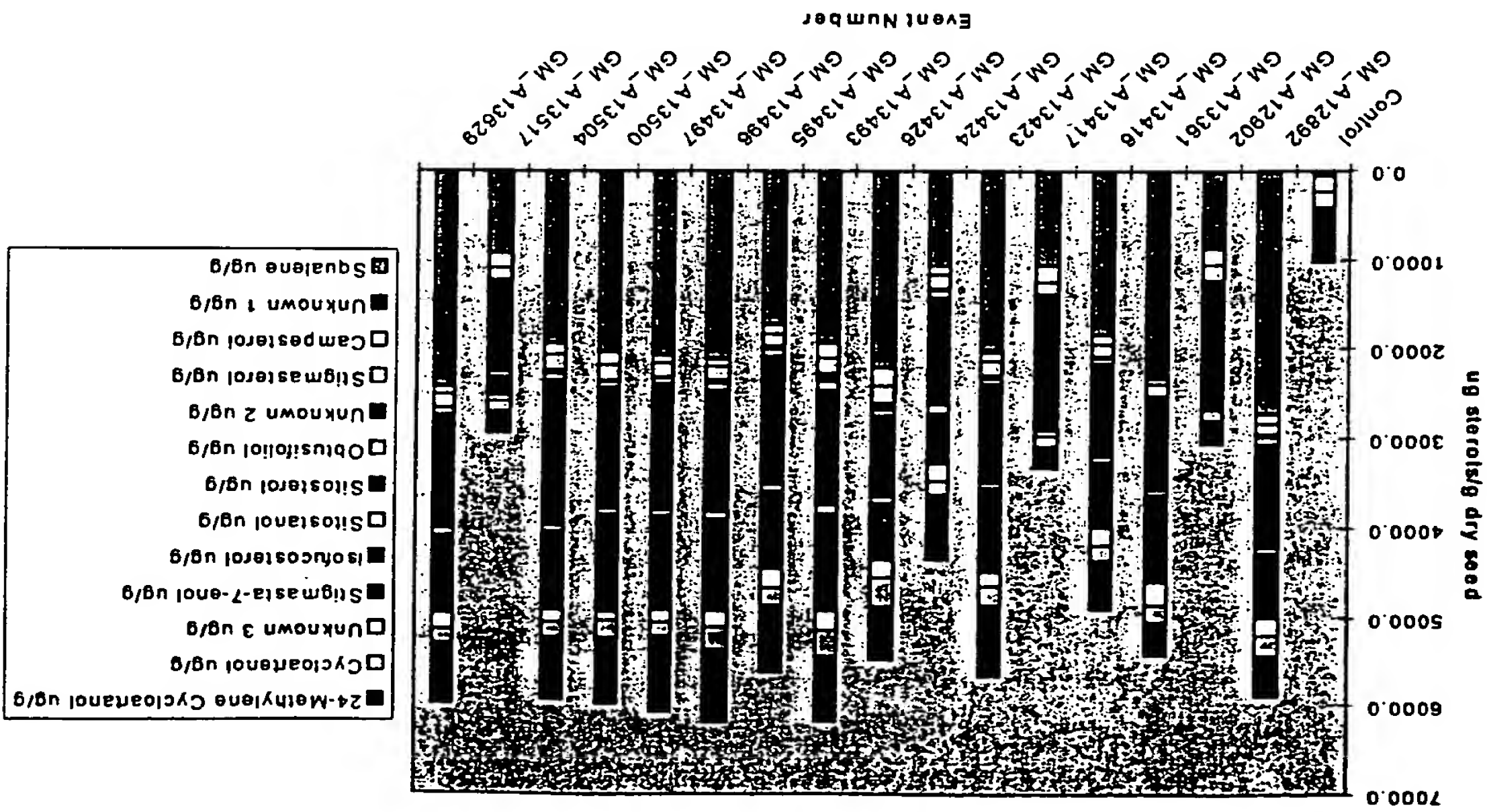
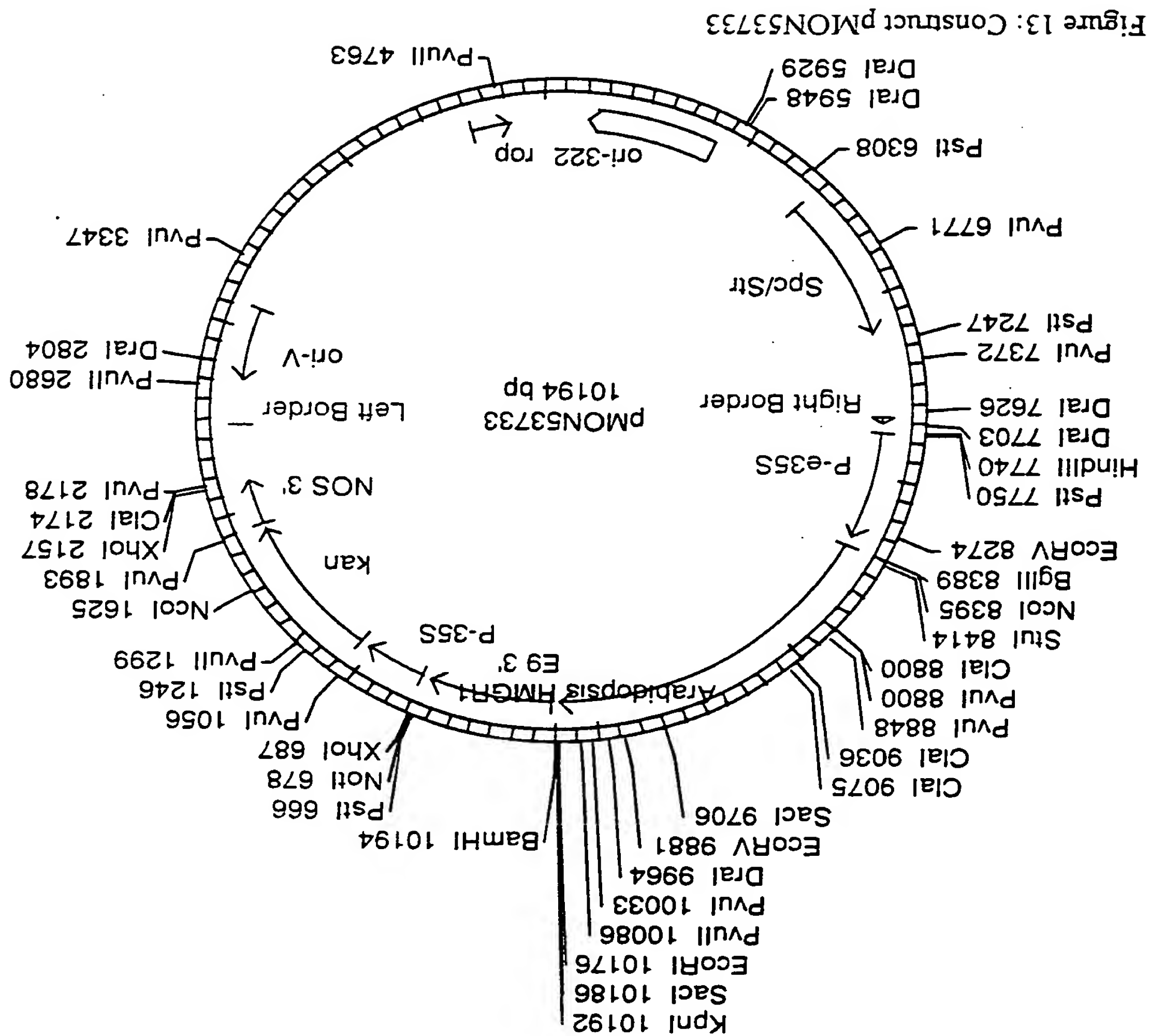


Figure 12: Sterol composition of R1 transgenic soybean seeds when *Arabidopsis* truncated HMGR (catalytic domain without linker) and *Arabidopsis* SMTII were overexpressed (data from PMON43058: p7S::At HMGR truncated & p7S::At SMTII). The expression of the genes is controlled by the seed-specific 7S promoter.



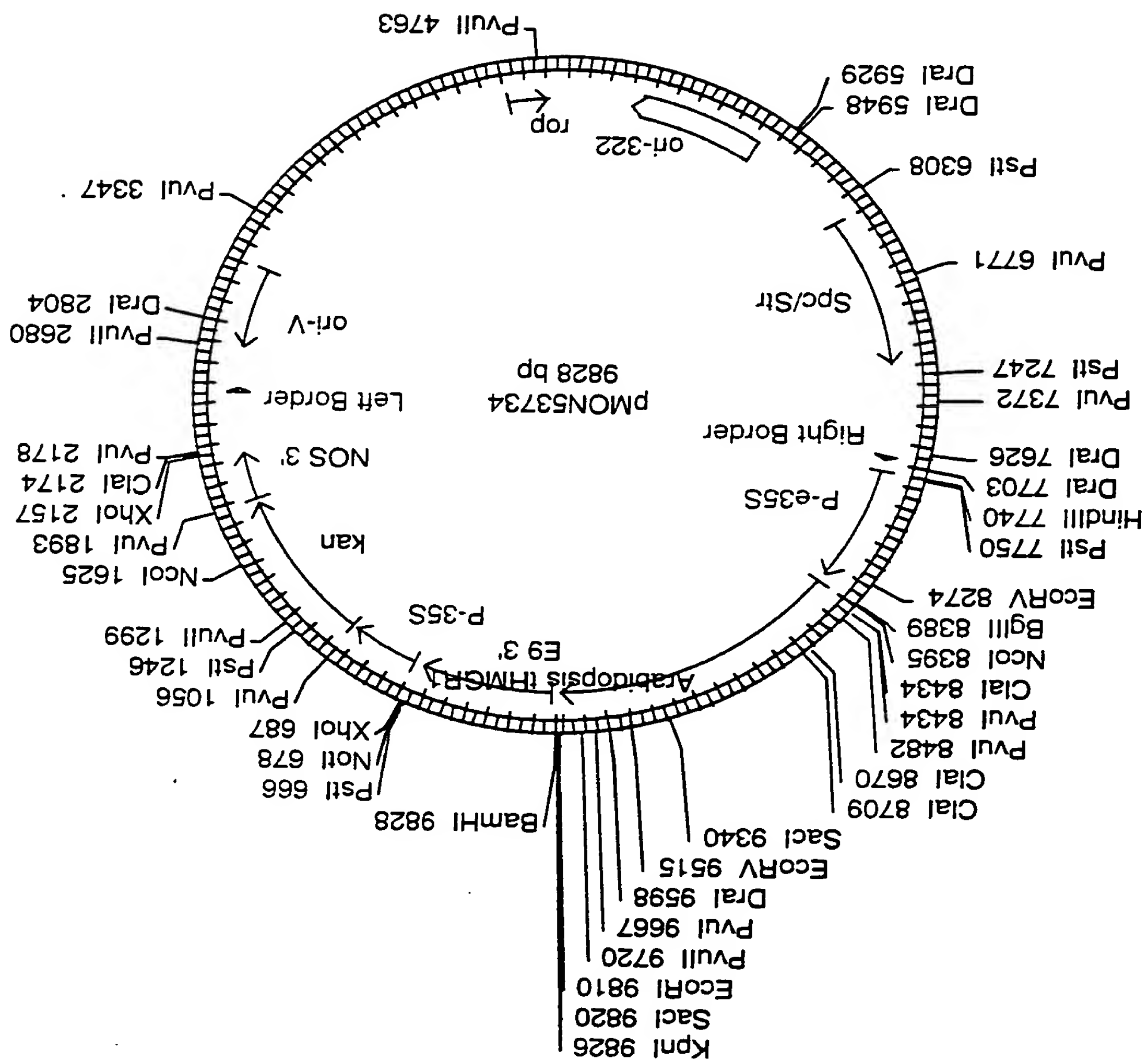
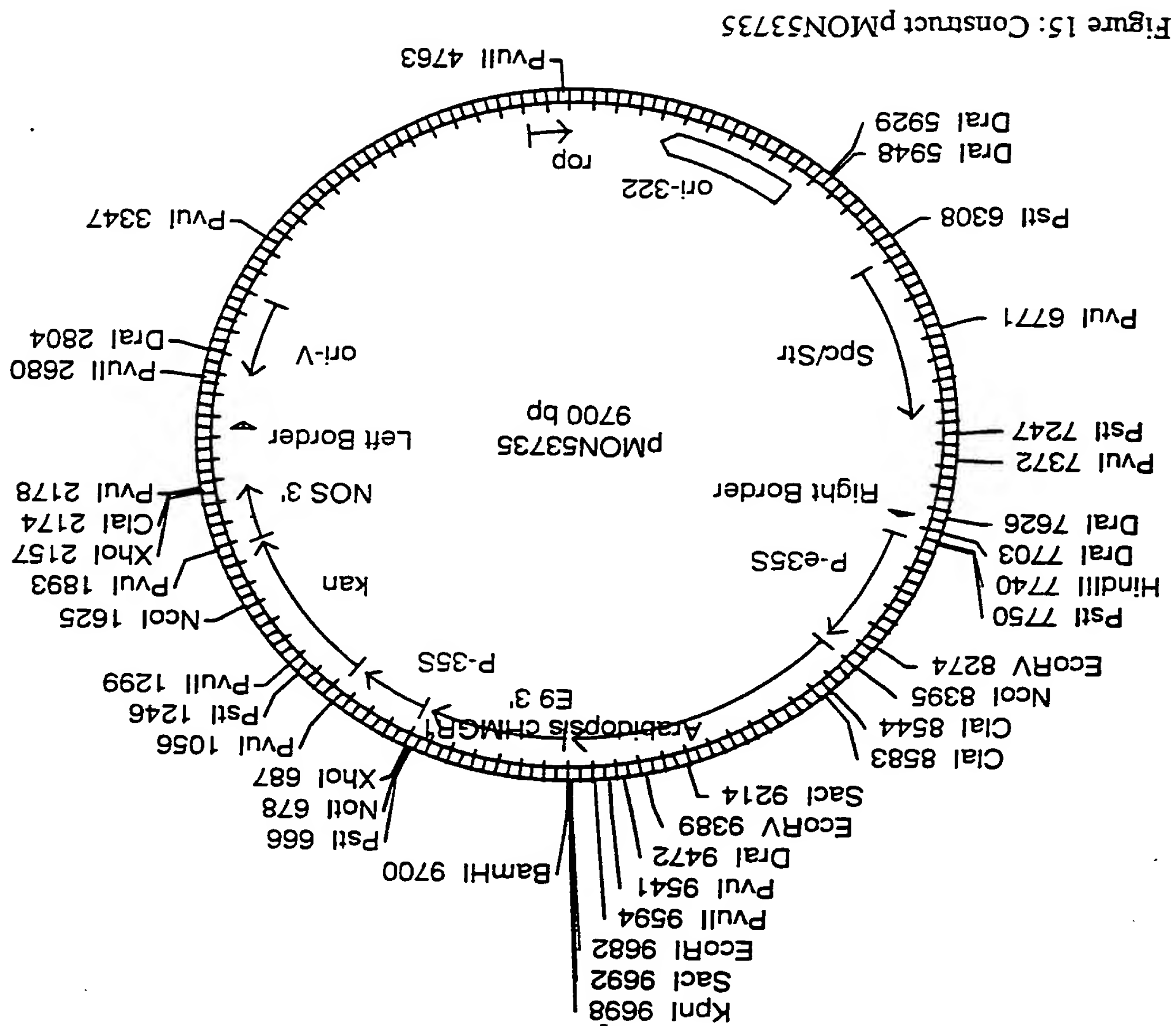


Figure 14: Construct pMON53734



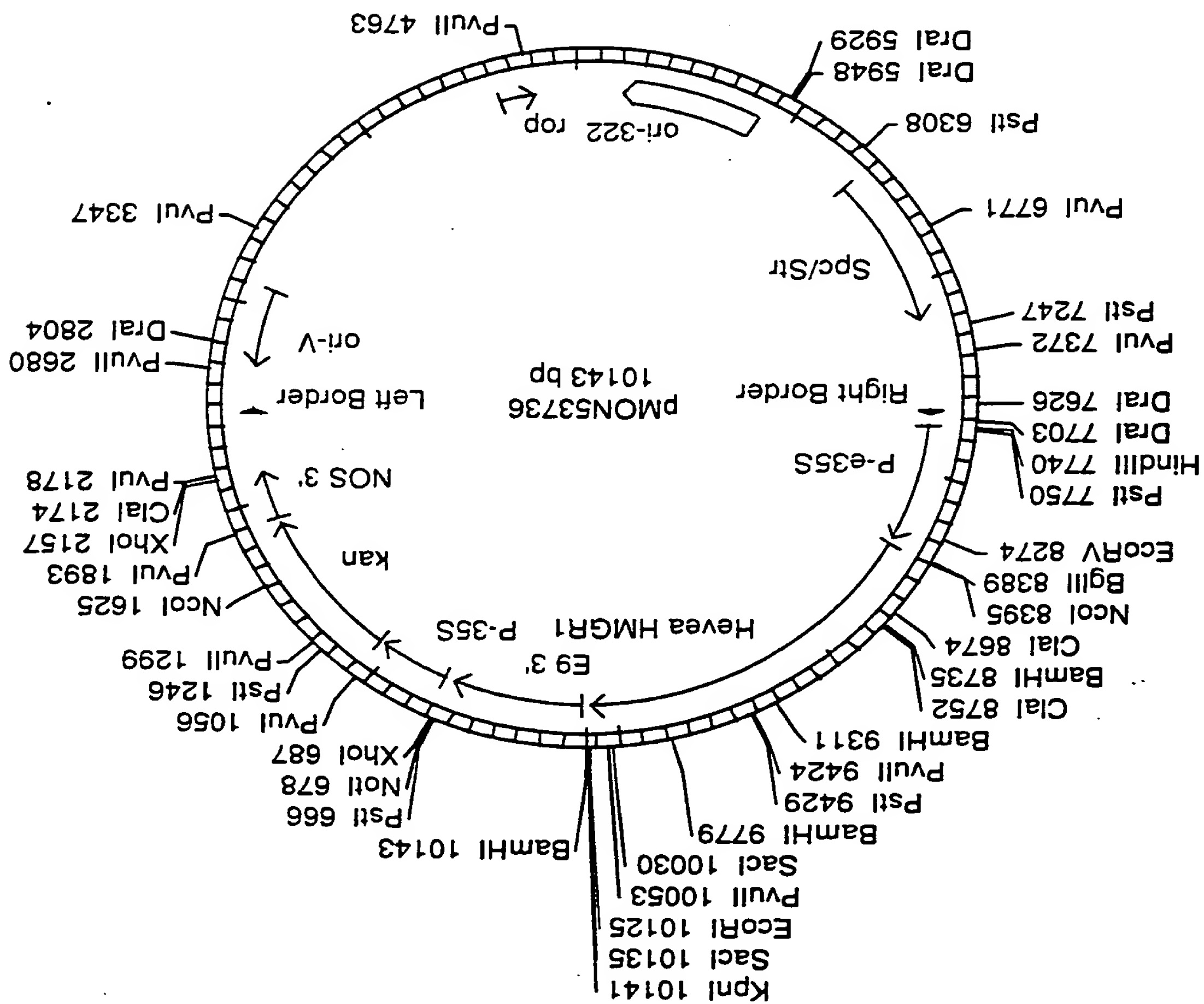
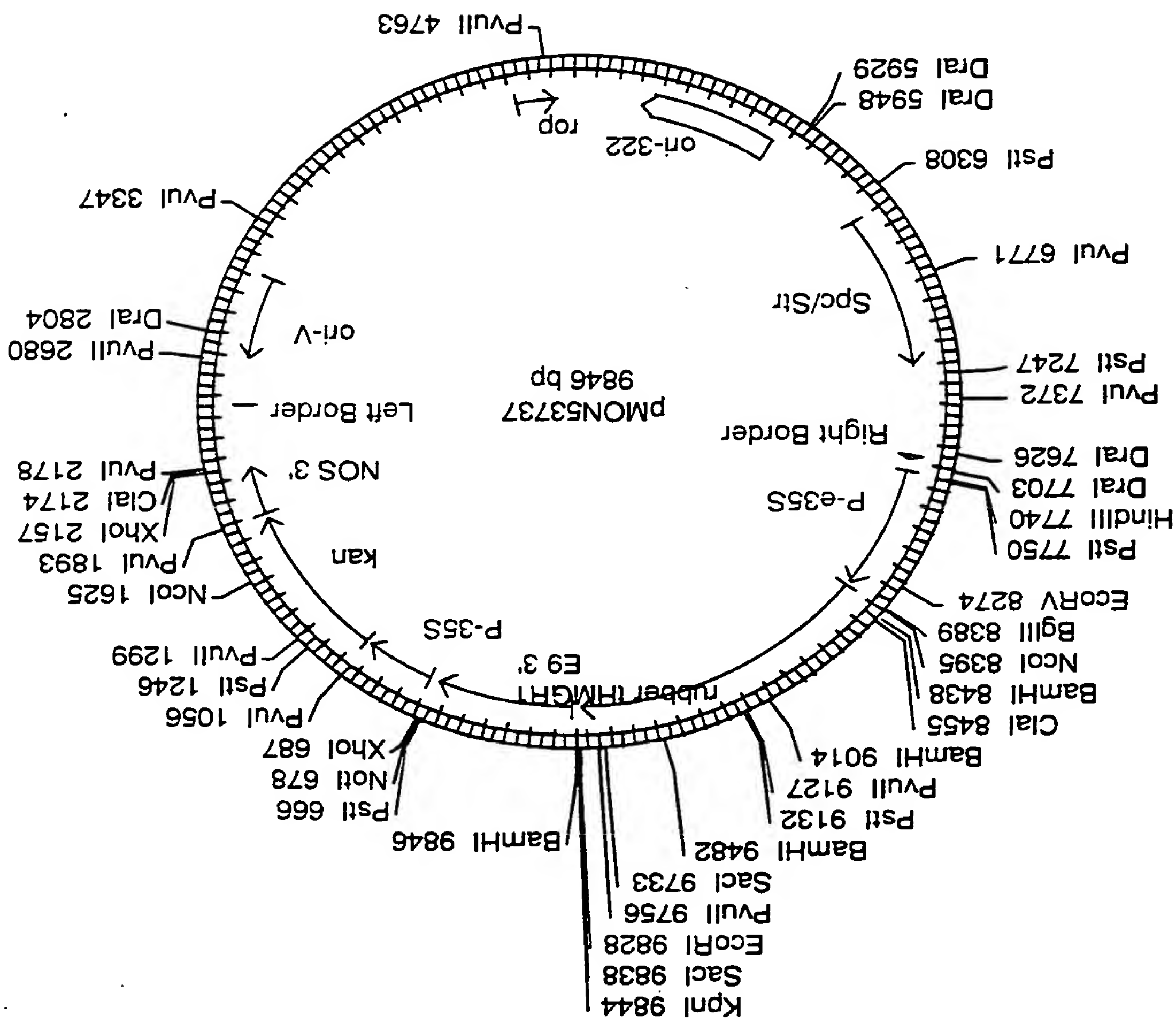


Figure 16: Construct pMON53736

Figure 17: Construct pMON53737





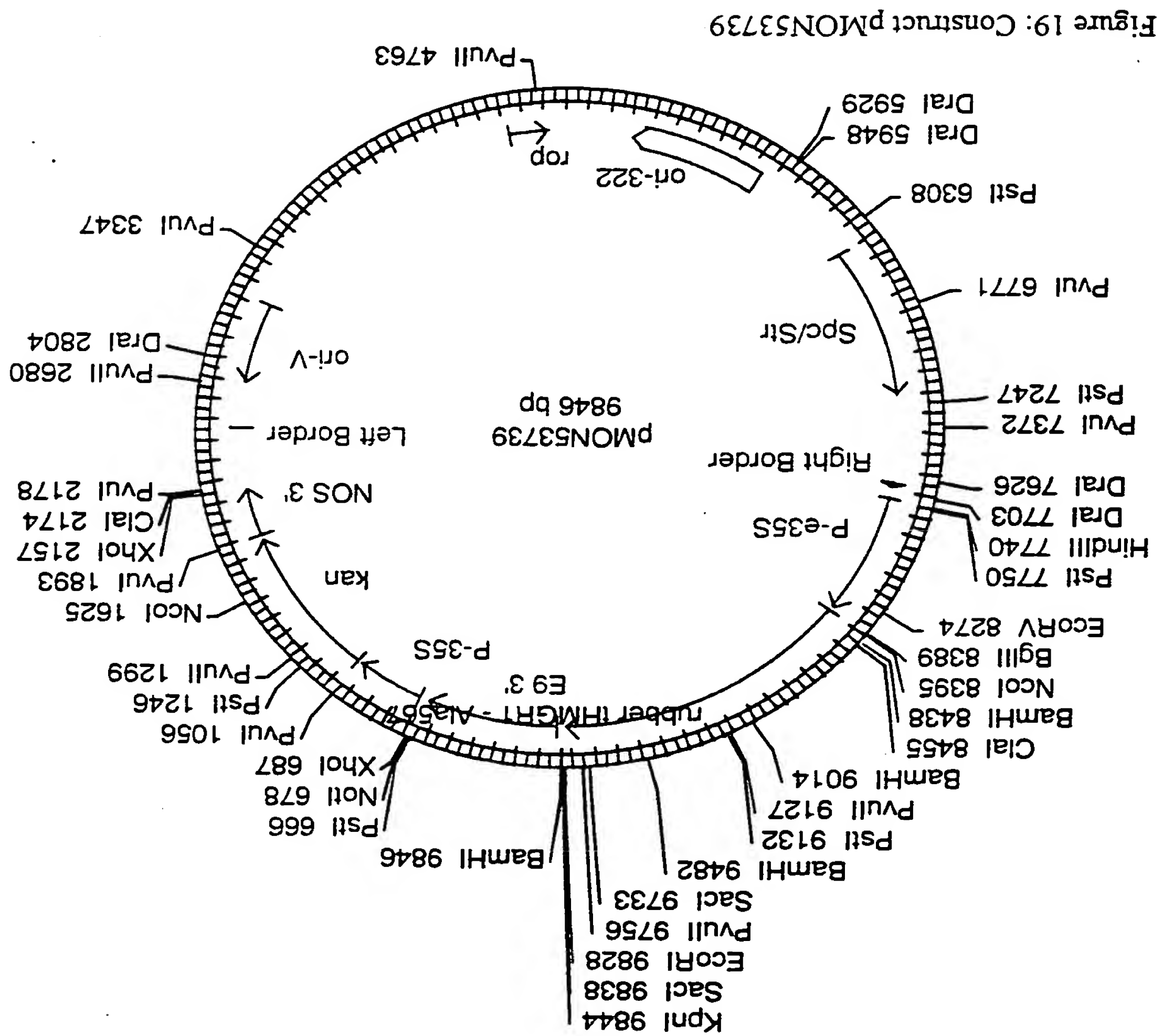




FIG. 21

Comparison of Cycloartenol Levels in Transgenic Plants

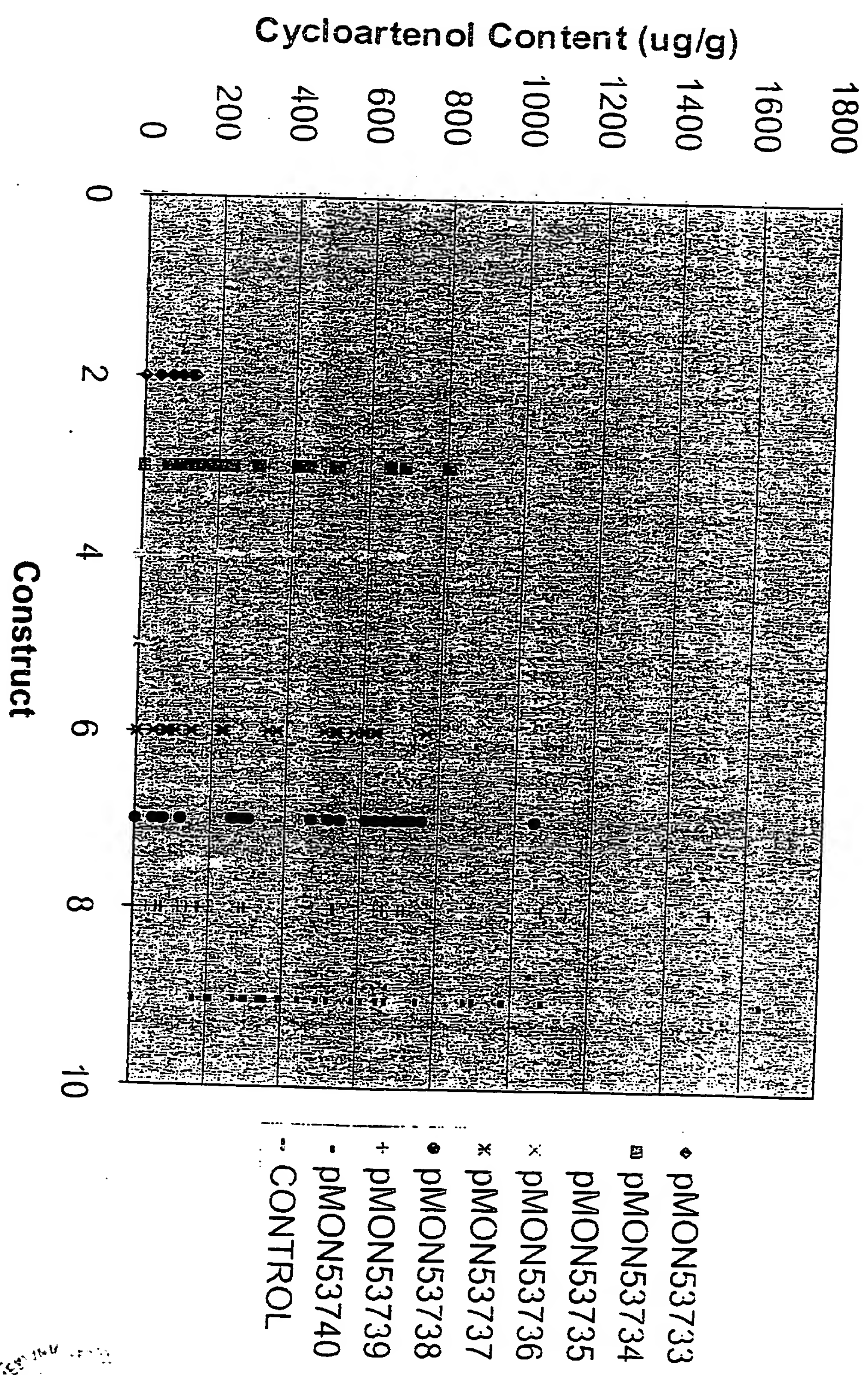


FIG. 22

Comparison of 24-Methylene Cycloartenol in Transgenic Plants

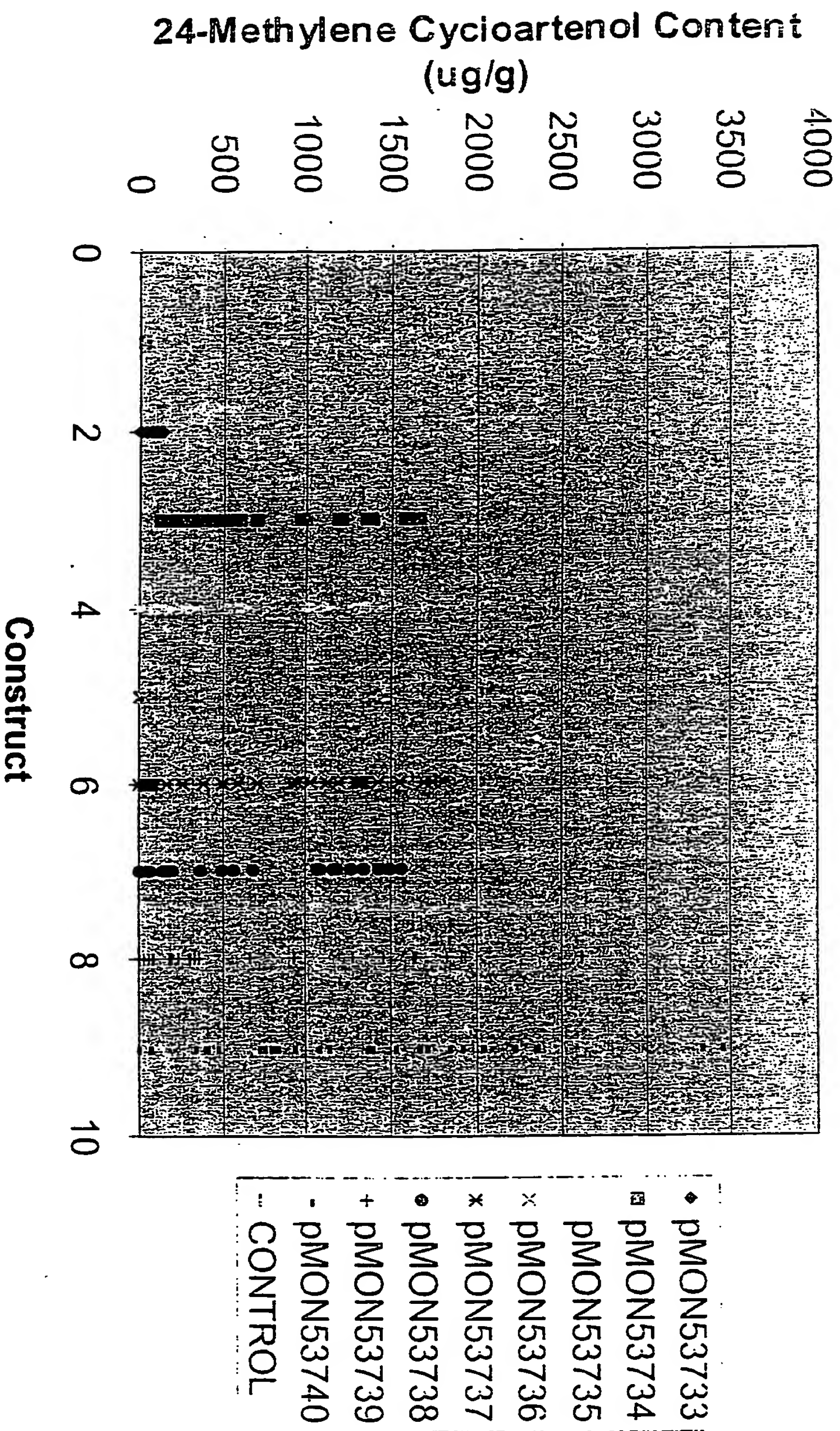


FIG. 23

Comparison of Obtusifoliol Levels in Transgenic Plants

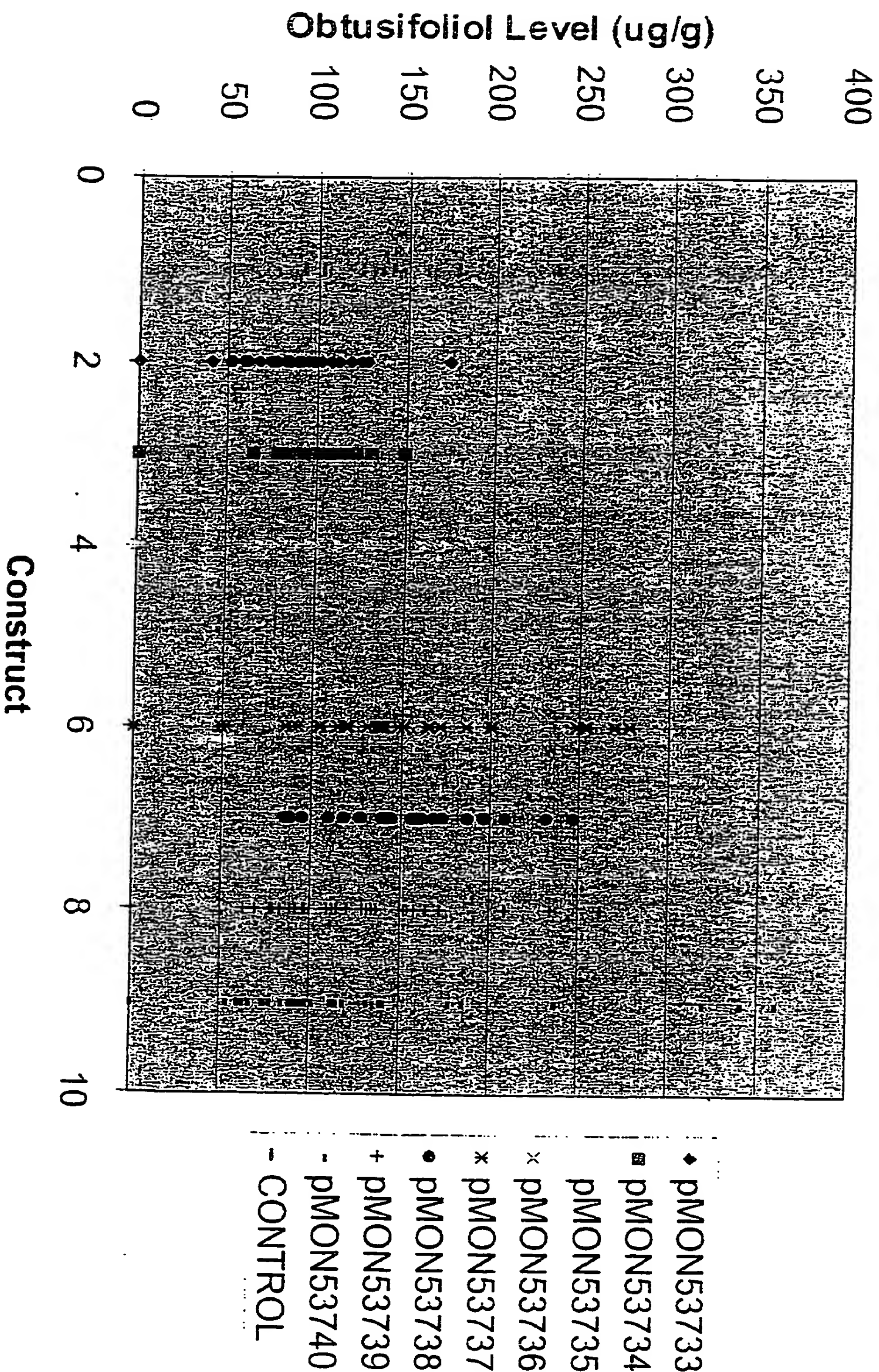


FIG. 24

Comparison of Campesterol Levels in Transgenic Plants

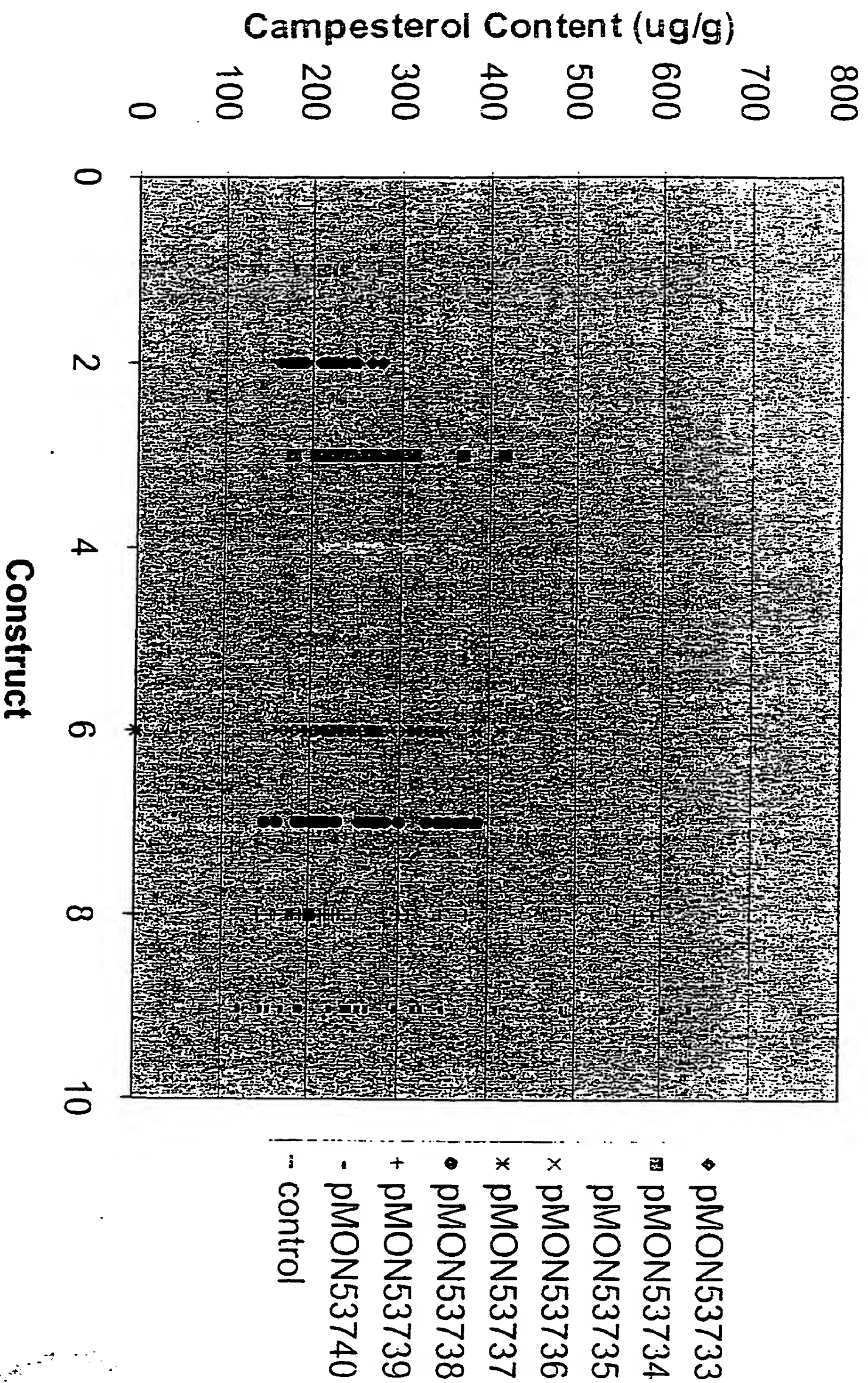


FIG. 25

Comparison of Sitosterol Levels in Transgenic Plants

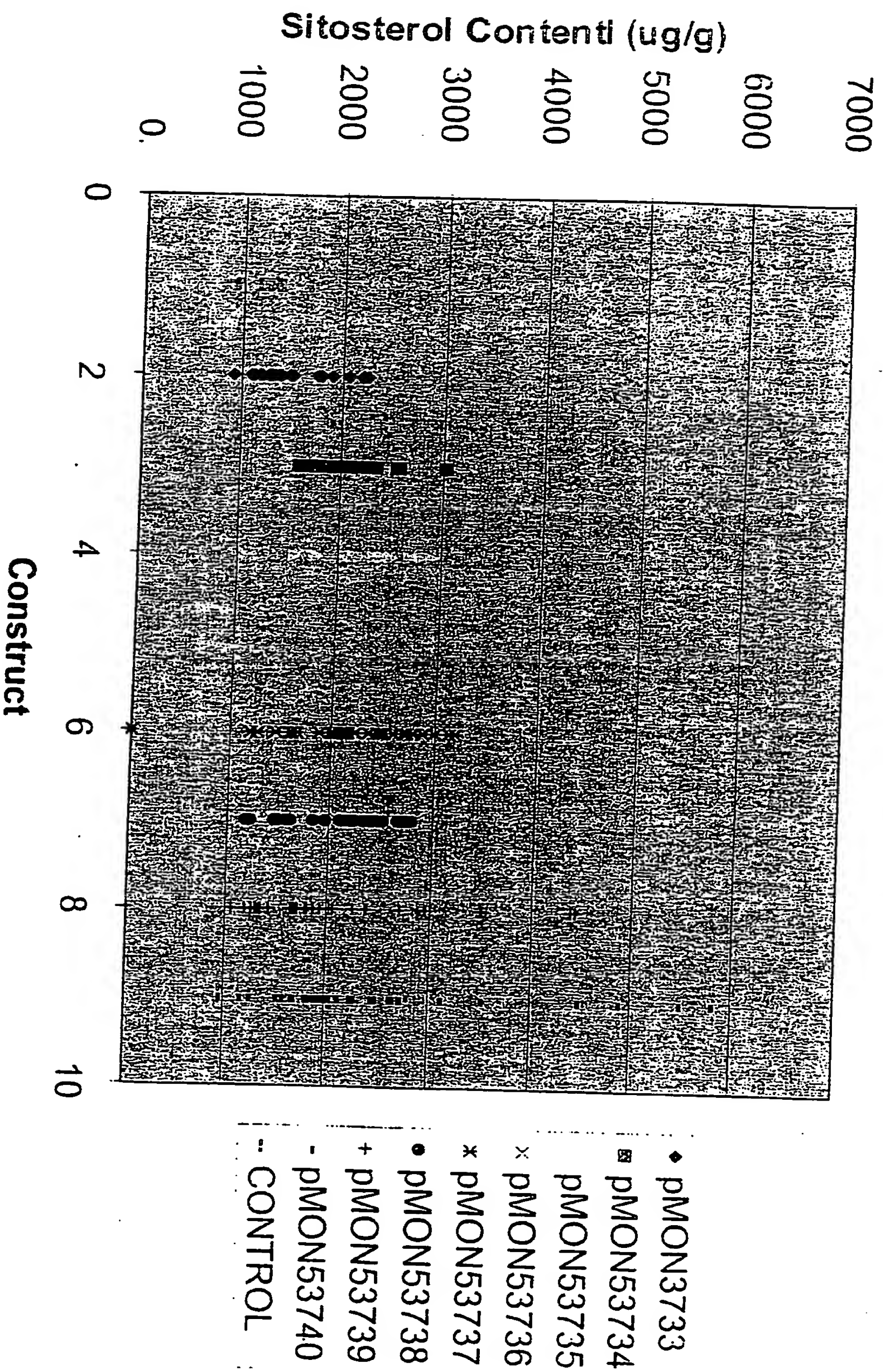


FIG. 26

Comparison of Sitostanol Levels in Transgenic Plants

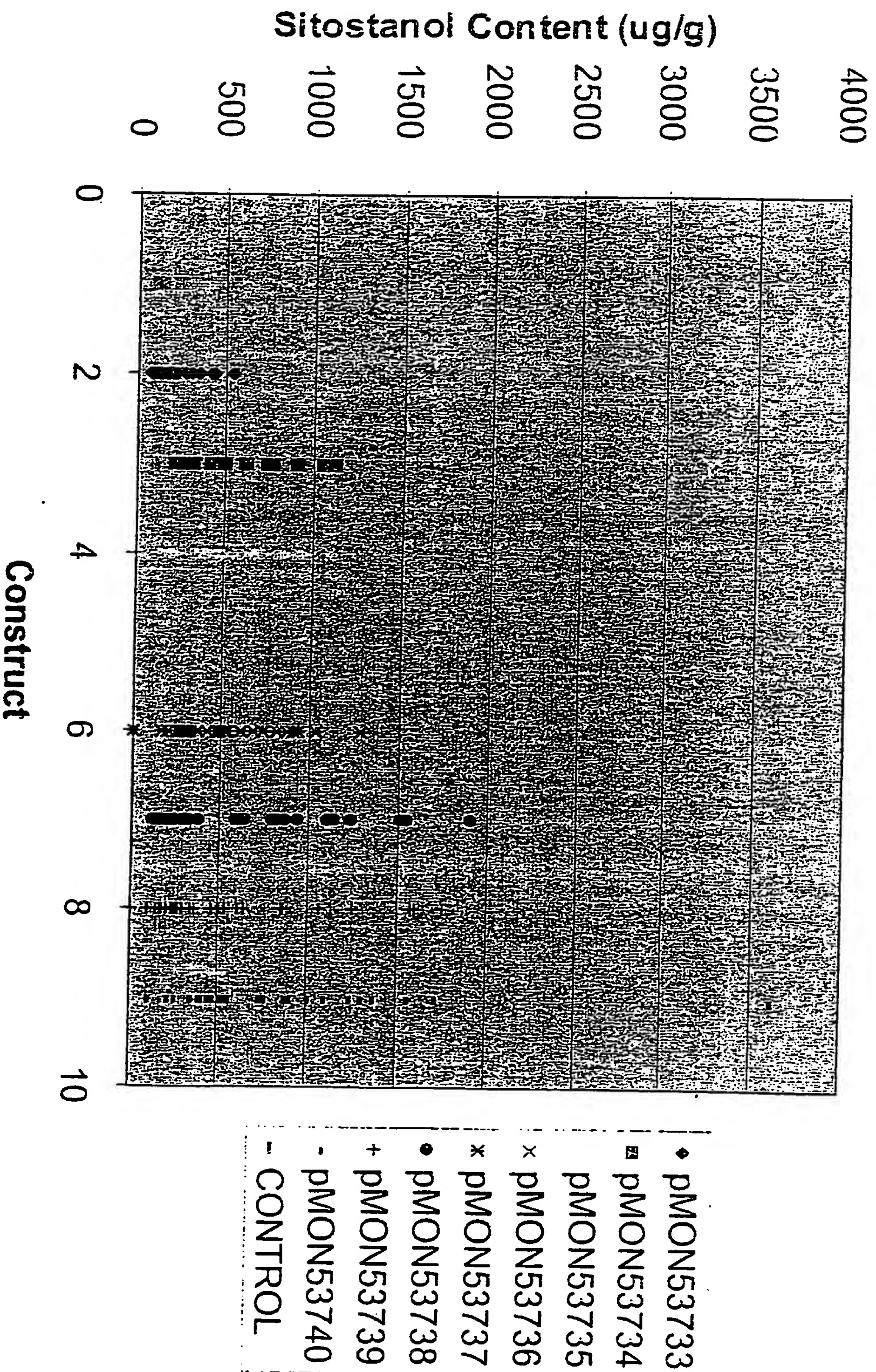


FIG. 27

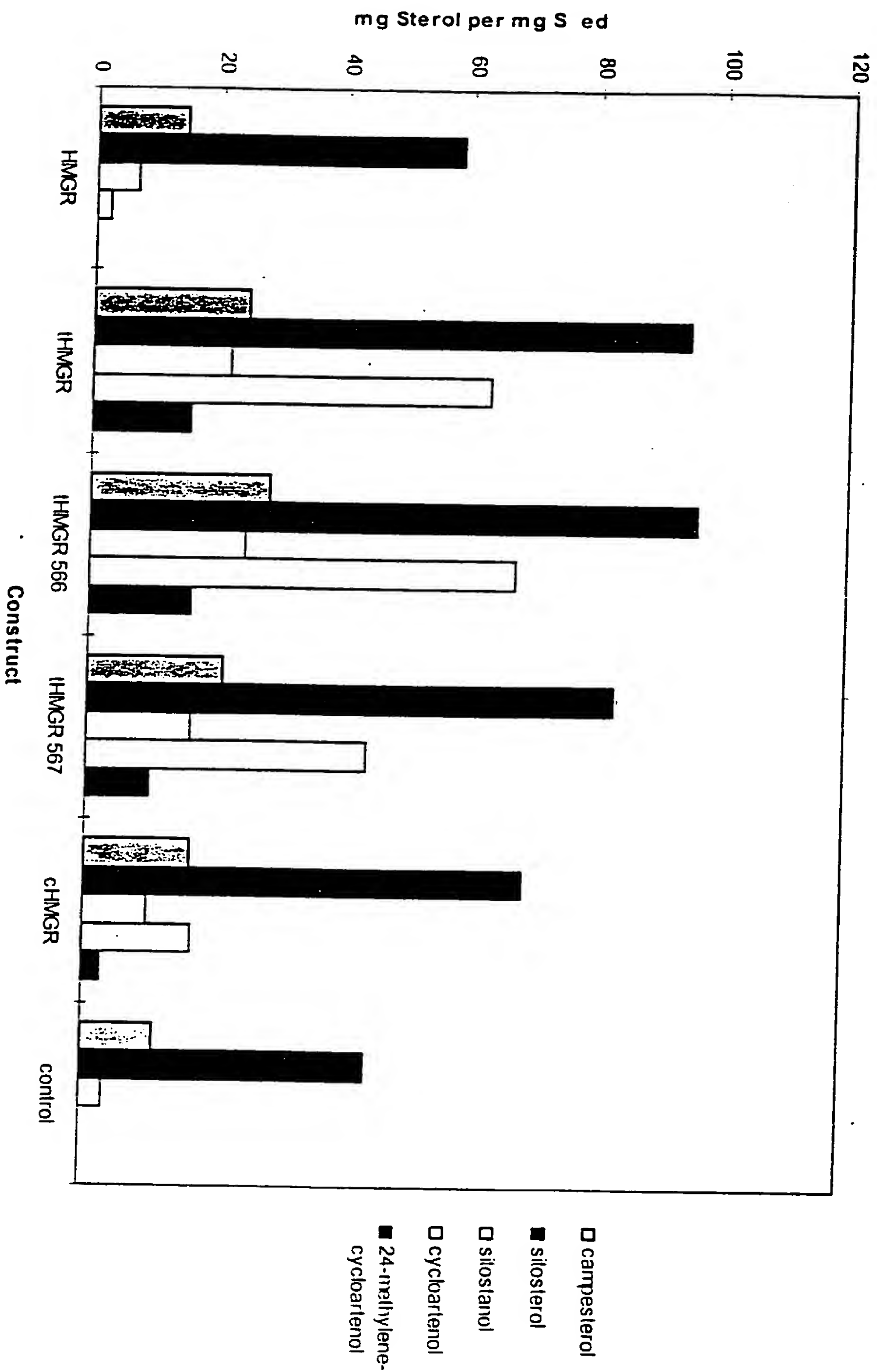
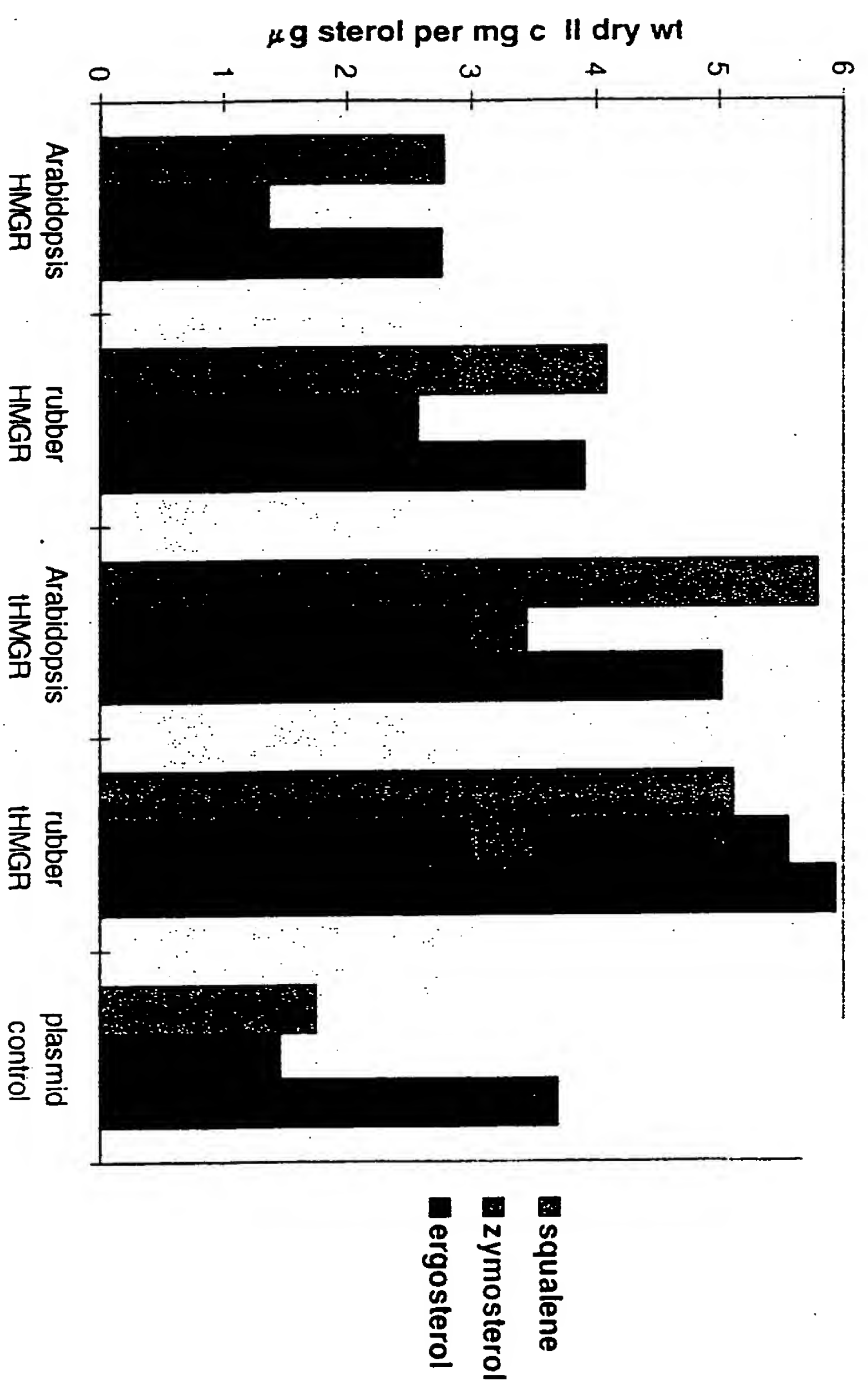


FIG. 28

Plant HMGGR Constructs in Yeast HMGGR1 Knockout Mutant



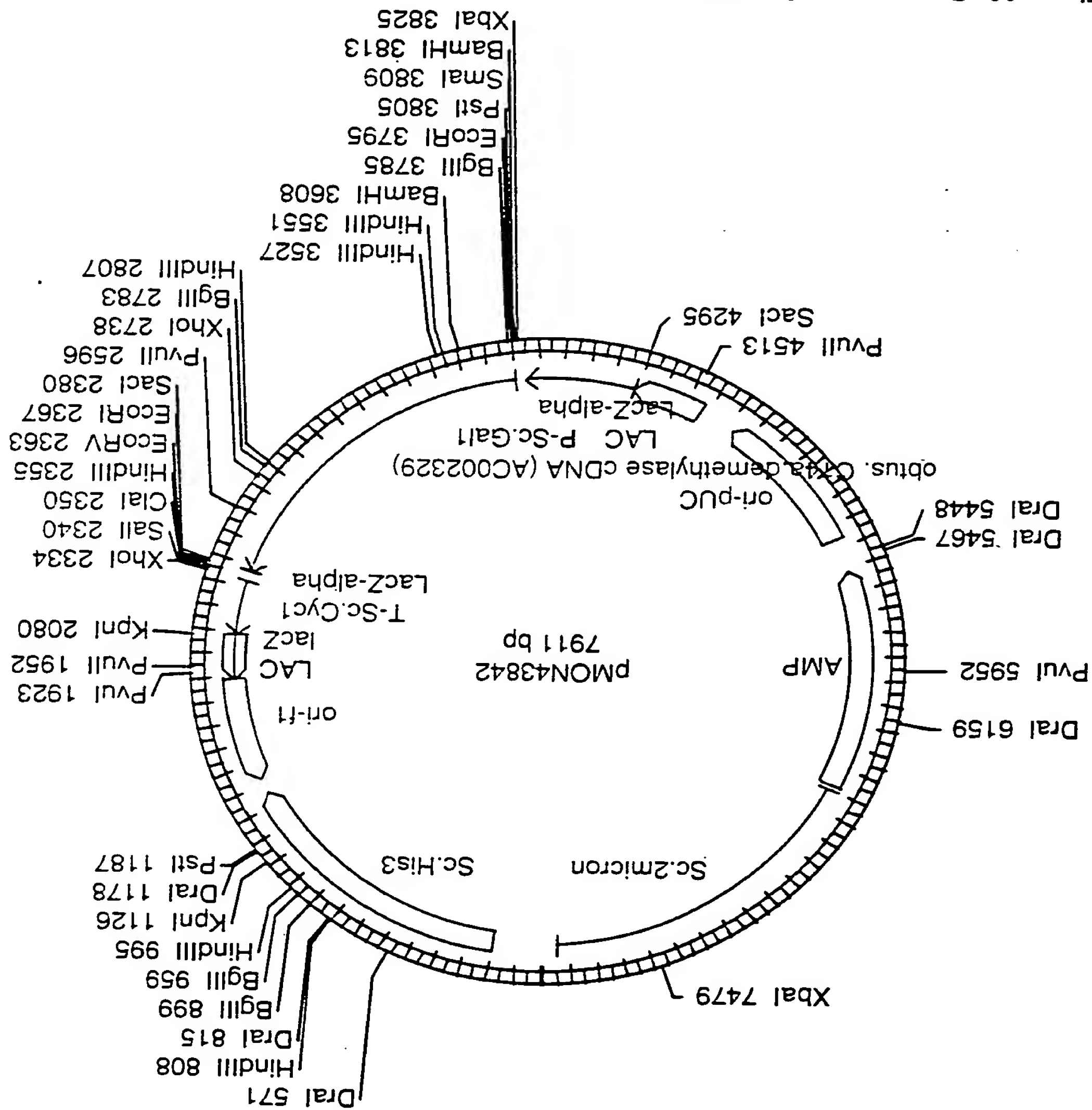
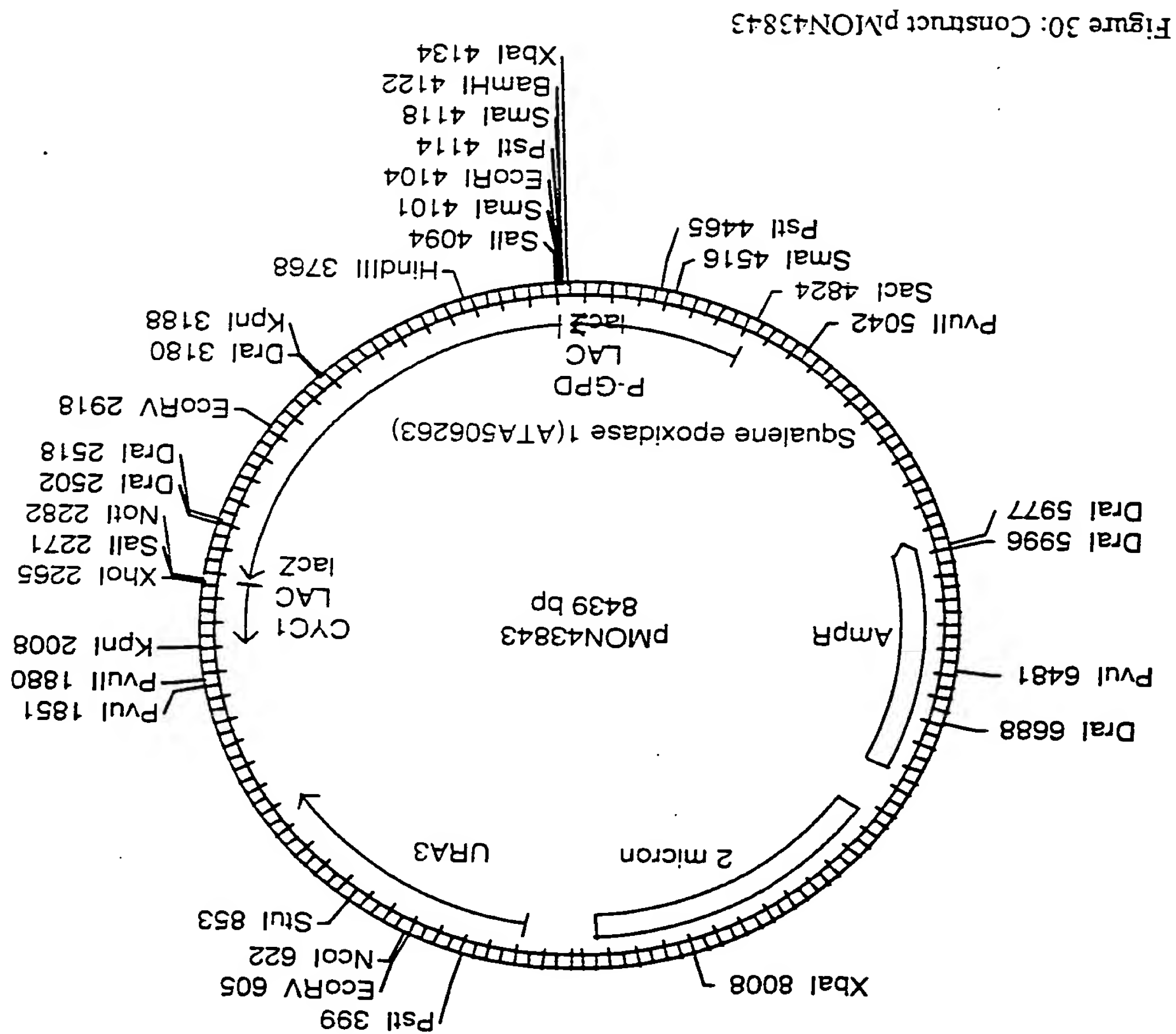


Figure 29: Construct pMON43842



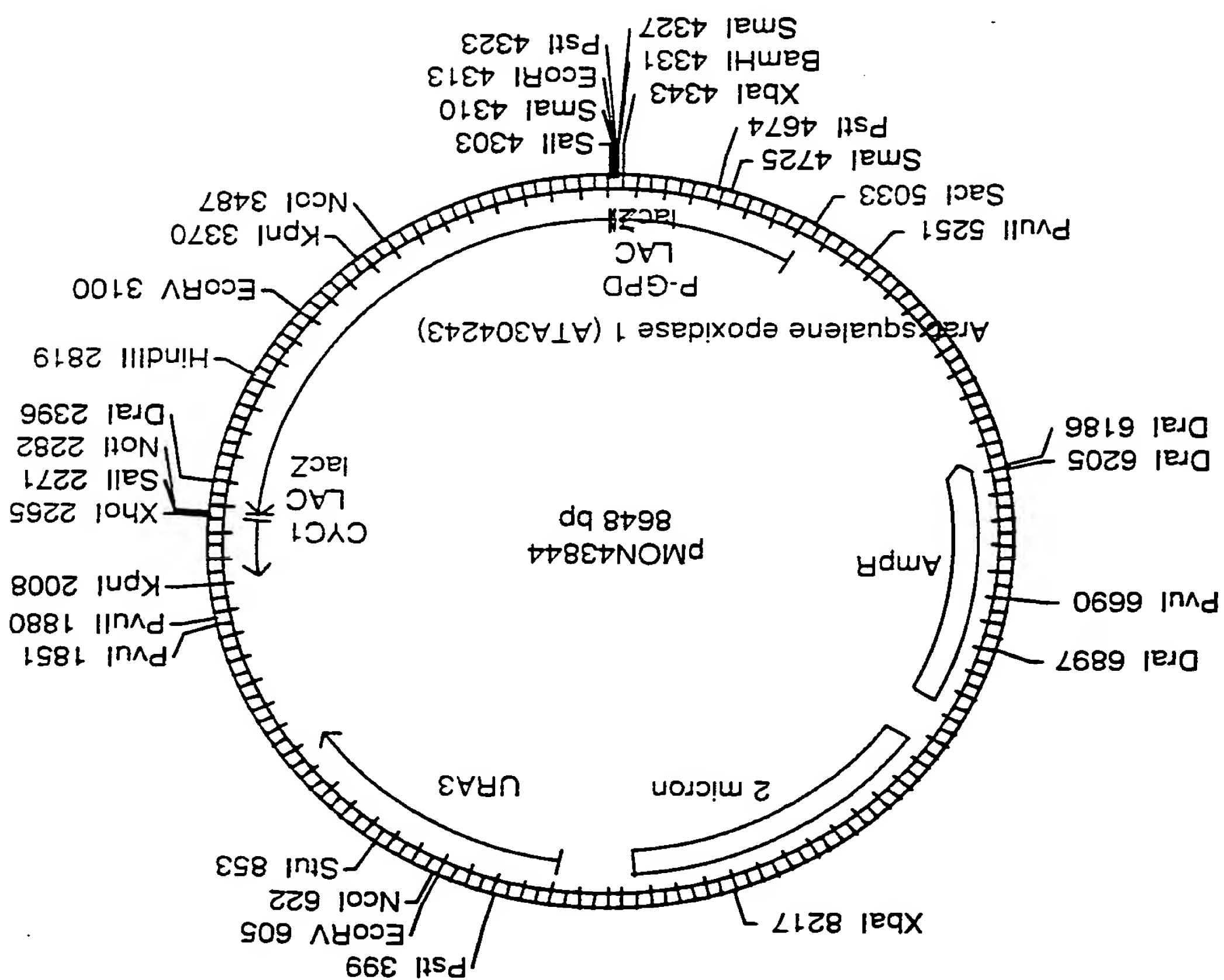


Figure 31: Construct pMON43844

FIG. 32A

Plurality: 5.00 Threshold: 4 AveWeight 1.00 AveMatch 2.91 AvMatch -2.00

50	HMGRclustalW{methanobac}	.....
	HMGRclustalW{methanococ}	.....
	HMGRclustalW{halobacter}	.....
	HMGRclustalW{sulfolobus}	.....
	HMGRclustalW{yeast2}	.....
	HMGRclustalW{yeast1}	.....
	HMGRclustalW{phycomyces}	.....
	HMGRclustalW{fusarium}	.....
	HMGRclustalW{candida}	.....
	HMGRclustalW{dictyostez}	.....
	HMGRclustalW{wheat1}	.....
	HMGRclustalW{rice}	.....
	HMGRclustalW{corn}	.....
	HMGRclustalW{wheat3}	.....
	HMGRclustalW{wheat2}	.....
	HMGRclustalW{soybean}	.....
	HMGRclustalW{rubber3}	.....
	HMGRclustalW{rosyperv1}	.....
	HMGRclustalW{tomato}	.....
	HMGRclustalW{woodtobacc}	.....
	HMGRclustalW{potato}	.....
	HMGRclustalW{radish}	.....
	HMGRclustalW{arabadopis1}	.....
	HMGRclustalW{cucumisamel}	.....
	HMGRclustalW{rubber2}	.....
	HMGRclustalW{rubber1}	.....
	HMGRclustalW{campthec}	.....
	HMGRclustalW{arabadops2}	.....
	HMGRclustalW{chineseham}	.....

HMGRclustalW{chinese2}	.....
HMGRclustalW{syrhamst}	.....
HMGRclustalW{rat}	.....
HMGRclustalW{rabbit}	.....
HMGRclustalW{human}	.....
HMGRclustalW{mouse}	.....
HMGRclustalW{xenopus}	.....
HMGRclustalW{sea urchin}	.....
HMGRclustalW{cockroach}	.....
HMGRclustalW{drosophila}	.....
HMGRclustalW{dictyostel}	.....
HMGRclustalW{schistosom}	.....
HMGRclustalW{archaeoglo}	.....
HMGRclustalW{pseudomonas}	.....
Consensus	-----

FIG. 32B



HMGRclustalw{methanobac}
 HMGRclustalw{methanococ}
 HMGRclustalw{halobacter}
 HMGRclustalw{sulfolobus}
 HMGRclustalw{yeast2}
 SSKRADITYT
 HMGRclustalw{yeast1}
 TAHEASELPA
 HMGRclustalw{phycomyces}
 HMGRclustalw{fusarium}
 CCQVSNAMS
 HMGRclustalw{candida}
 VDLISKVPD
 HMGRclustalw{dictyostez}
 HMGRclustalw{wheat1}
 HMGRclustalw{rice}
 HMGRclustalw{corn}
 HMGRclustalw{wheat3}
 HMGRclustalw{wheat2}
 HMGRclustalw{soybean}
 HMGRclustalw{rubberrez3}
 HMGRclustalw{rosypervit1}
 HMGRclustalw{tomato}
 HMGRclustalw{woodtobacc}
 HMGRclustalw{potato}
 HMGRclustalw{radish}
 HMGRclustalw{arabadopsis1}
 HMGRclustalw{cucumismel}
 HMGRclustalw{rubberrez2}
 HMGRclustalw{rubberrez1}
 HMGRclustalw{camptothec}
 HMGRclustalw{arabadops2}
 HMGRclustalw{chineseham}
 GLFVASHPWE
 HMGRclustalw{chineseha2}

001

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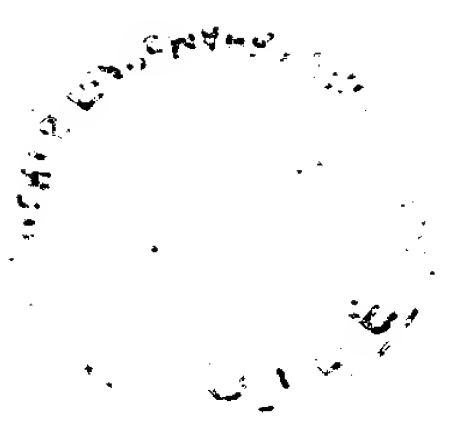
[illegible]

FIG. 32C

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GLFVASHPWE	HMGRclustalW{syrjanhamst}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{rat}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{rabbit}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{human}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{mouse}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{xenopus}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{sea urchin}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{cockroach}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{drosophila}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{dictyostel}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{schistosom}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{archaeoglo}	GLFVASHPWE	MLSRLFRMH
GLFVASHPWE	HMGRclustalW{pseudomonas}	GLFVASHPWE	MLSRLFRMH
Consensus		Consensus	MLSRLFRMH

FIG. 32D



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[illegible]

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FIG. 32F

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HMGRclustalW{chinesezhaz}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{syrilanhams}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{rat}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{rabbit}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{human}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{mouse}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{xenopus}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{sea urchin}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{cockroach}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{drosophila}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{dictyostel}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{schistosom}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{archaeoglo}	VIVGTVT..L TICMMSMN.. MFTGNK
HMGRclustalW{pseudomonas}	VIVGTVT..L TICMMSMN.. MFTGNK
Consensus	VIVGTVT..L TICMMSMN.. MFTGNK

FIG. 326

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200	HMGRclustalw{methanobac}
	HMGRclustalw{methanococ}
	HMGRclustalw{halobacter}
	HMGRclustalw{sulfolobus}	.....	.....
	HMGRclustalw{yeast2}	FIILAYLTL	NGTKWRLRNN SNFIIDLHNI YRNMVKQFSN KTSEFDQFDL
	HMGRclustalw{yeast1}	LIMVTAYLMM	DGTKWRLRSD RKSILFDVKTL AYSLYDVSE NVTQADPFDV
	HMGRclustalw{phycomyces}	.....	.....
	HMGRclustalw{fusarium}	NIVLTRAAMS	SSVFAFLFGL VTTKLGVPI SVILLSEGLP FLVVTIGFEK
	HMGRclustalw{candida}	ALVTAYIAM	DGTWRSRAY HGKLGKYS DM AVGAFNKVLN LVRGAETFDI
	HMGRclustalw{dictyostez}	.....	.....
	HMGRclustalw{wheat1}	.....	.....
	HMGRclustalw{rice}	.....	.....
	HMGRclustalw{corn}	.....	.....
	HMGRclustalw{wheat3}	.....	.....
	HMGRclustalw{wheat2}	.....	.....
	HMGRclustalw{soybean}	.....	.....
	HMGRclustalw{rubbertre3}	.....	.....
	HMGRclustalw{rosypertiwi}	.....	.....
	HMGRclustalw{tomato}	.....	.....
	HMGRclustalw{woodtobacc}	.....	.....
	HMGRclustalw{potato}	.....	.....
	HMGRclustalw{radish}	.....	.....
	HMGRclustalw{arabadopsi1}	.....	.....
	HMGRclustalw{cucumis mel}	.....	.....
	HMGRclustalw{rubbertre2}	.....	.....
	HMGRclustalw{rubbertre1}	.....	.....
	HMGRclustalw{campothec}	.....	.....
	HMGRclustalw{arabadops2}	.....	.....
	HMGRclustalw{chinese ham}	.....	.....
151	IIITIR CIA	.....	I CGWNYEC .PK FEEDVLTSSDI

HMGRClustalW{chinese2}	.....I CGWNYEC.PK FEEDVLSSDI
IIITTRCIA	
HMGRClustalW{syrhamst}	.....I CGWNYEC.PK FEEDVLSSDI
IIITTRCIA	
HMGRClustalW{rat}	.....I CGWNYEC.PK FEEDVLSSDI
IIITTRCIA	
HMGRClustalW{rabbit}	.....I CGWNYEC.PK FEEDVLSSDI
IIITTRCIA	
HMGRClustalW{human}	.....I CGWNYEC.PK FEEDVLSSDI
IIITTRCIA	
HMGRClustalW{mouse}	.....I CGWNYEC.PK FEEDVLSSDI
IIITTRCIA	
HMGRClustalW{kenopus}	.....I CGWNYAC.PK FEEDVLSSDI
IIITTRCIA	
HMGRClustalW{sea urchin}	.....I CGWNYECAPQ VKESLSSDI
LVMCIMRTLA	
HMGRClustalW{cockroach}	.....PGWGHNC..I TLEENYADM
IVMTLIRVA	
HMGRClustalW{drosophila}	GTIPSSMG SATSSRHRPC HGWSQSC.DG LEAFYNAADV
ILMTIVRCTA	
HMGRClustalW{dictyostel}	.....M LKILNTVLF FDCFSITGTF
IIITTRCIA	
HMGRClustalW{schistosom}	.....I CGWNYEC.PK FEEDVLSSDI
VLLIYLFTRL	
HMGRClustalW{archaeoglo}	.....I CGWNYEC.PK FEEDVLSSDI
HMGRClustalW{pseudomonas}I CGWNYEC.PK FEEDVLSSDI
IIITTRCIA	
Consensus	-----I CGWNYEC.PK FEEDVLSSDI

FIG. 32H

THE

WORLD

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FUTURE.

HMGRclustalw{methanobac}	
HMGRclustalw{methanococ}	
HMGRclustalw{halobacter}	
HMGRclustalw{sulfolobus}	.....
HMGRclustalw{yeast2}	.....	EYTLCCLEND MRKIGSKFWL SFSATSNSAC ATLSLYTTH
HMGRclustalw{yeast1}	.....	EYTIIFGLFND MRKTGSNFWL SASTVNSAS SLFLALYVTQ
HMGRclustalw{phycomyces}	.....
HMGRclustalw{fusarium}	.....	HAIEHRRIOA QNSKSGKRSP DGSTQNMIOY AVQAAIKEXG
HMGRclustalw{candida}	.....	EYTLFNLFAR MRAVGSKVWL GLSTLVSSFF AFLFALYITT
HMGRclustalw{dictyostez}	.....
HMGRclustalw{wheat1}	.....
HMGRclustalw{rice}	.....
HMGRclustalw{corn}	.....
HMGRclustalw{wheat3}	.....
HMGRclustalw{wheat2}	.....
HMGRclustalw{soybean}	.....
HMGRclustalw{rubbertree3}	.....
HMGRclustalw{rosyperiwi}	.....
HMGRclustalw{tomato}	.....
HMGRclustalw{woodtobacc}	.....
HMGRclustalw{potato}	.....
HMGRclustalw{radish}	.....
HMGRclustalw{arabadops1s1}	.....
HMGRclustalw{cucumisamel}	.....
HMGRclustalw{rubbertree2}	.....
HMGRclustalw{rubbertree1}	.....
HMGRclustalw{camptothec}	.....
HMGRclustalw{arabadops2}	.....
HMGRclustalw{chineseham}	ILYIYFQFQN LRQLGSKVIL GIAGLETTIFS SEVESVVIH

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FIG. 32I

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Consensus	ILYIFQFN LRQLSKYL GIAGLTIFS SEVESTVIH
HMGRclustalw{chinese2}	ILYIFQFN LRQLSKYL GIAGLTIFS SEVESTVIH
HMGRclustalw{syrhahamst}	ILYIFQFN LRQLSKYL GIAGLTIFS SEVESTVIH
HMGRclustalw{rat}	ILYIFQFN LRQLSKYL GIAGLTIFS SEVESTVIH
HMGRclustalw{rabbit}	ILYIFQFN LRQLSKYL GIAGLTIFS SEVESTVIH
HMGRclustalw{human}	ILYIFQFN LRQLSKYL GIAGLTIFS SEVESTVIH
HMGRclustalw{mouse}	ILYIFQFN LRQLSKYL GIAGLTIFS SEVESTVIH
HMGRclustalw{xenopus}	ILYIFQFN LRQLSKYL GIAGLTIFS SEVESTVIH
HMGRclustalw{sea urchin}	VAYLYLQFTK LRTTGSKYL GIAGLTIFS SEVESTVIH
HMGRclustalw{cockroach}	VLASYQFCH LQKLSKYL GIAGLTIFS SEVESTVIH
HMGRclustalw{drosophila}	VLQCYQFCS LHRLSKYL GIAGLTIFS SEFTTALIK
HMGRclustalw{dictyostel}	.....
HMGRclustalw{schistosom}	RTHLTHFSS NCHLDVILYQ SRAVILFLV FVYFIGVLTIC
KINDKILVHT HMGRclustalw{archaeoglo}	.....
HMGRclustalw{pseudomonas}	.....
Consensus	ILYIFQFN LRQLSKYL GIAGLTIFS SEVESTVIH

Accession	Protein Name	Gene Name	Species	Accession	Protein Name	Gene Name	Species
HMGRClustalW{methanobac}				HMGRClustalW{methanobac}			
HMGRClustalW{methanococ}				HMGRClustalW{methanococ}			
HMGRClustalW{halobacter}				HMGRClustalW{halobacter}			
HMGRClustalW{sulfolobus}				HMGRClustalW{sulfolobus}			
HMGRClustalW{yeast2}				HMGRClustalW{yeast2}			
HMGRClustalW{yeast1}				HMGRClustalW{yeast1}			
HMGRClustalW{phycomyces}				HMGRClustalW{phycomyces}			
HMGRClustalW{fusarium}				HMGRClustalW{fusarium}			
HMGRClustalW{candida}				HMGRClustalW{candida}			
HMGRClustalW{dictyostez}				HMGRClustalW{dictyostez}			
HMGRClustalW{wheat1}				HMGRClustalW{wheat1}			
HMGRClustalW{rice}				HMGRClustalW{rice}			
HMGRClustalW{corn}				HMGRClustalW{corn}			
HMGRClustalW{wheat3}				HMGRClustalW{wheat3}			
HMGRClustalW{wheat2}				HMGRClustalW{wheat2}			
HMGRClustalW{soybean}				HMGRClustalW{soybean}			
HMGRClustalW{rubbertree3}				HMGRClustalW{rubbertree3}			
VLNSFSHG.				VLNSFSHG.			
HMGRClustalW{rosyperiwi}				HMGRClustalW{rosyperiwi}			
LMPLAPHEGQ.				LMPLAPHEGQ.			
HMGRClustalW{tomato}				HMGRClustalW{tomato}			
KPLKPHKKQO				KPLKPHKKQO			
HMGRClustalW{woodbacc}				HMGRClustalW{woodbacc}			
KPLKPHK.				KPLKPHK.			
HMGRClustalW{potato}				HMGRClustalW{potato}			
EPLKQOE.				EPLKQOE.			
HMGRClustalW{radish}				HMGRClustalW{radish}			
..RFLDNRS				..RFLDNRS			
HMGRClustalW{arabadopsis1}				HMGRClustalW{arabadopsis1}			
GSFRSYQPT				GSFRSYQPT			
CTFRDEQDA				CTFRDEQDA			
HMGRClustalW{rubbertree2}				HMGRClustalW{rubbertree2}			
HMGRClustalW{rubbertree1}				HMGRClustalW{rubbertree1}			
..KHAAT				..KHAAT			
HMGRClustalW{camptothec}				HMGRClustalW{camptothec}			
PPMLKPKQPT				PPMLKPKQPT			
HMGRClustalW{arabadops2}				HMGRClustalW{arabadops2}			
..				..			
HMGRClustalW{chineseham}				HMGRClustalW{chineseham}			
VRENIRAGMA				VRENIRAGMA			

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FIG. 32K

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VRN1ARGMA	HMGRclustalw{chinese2}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{syr1anhamst}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{rat}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{rabbit}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{human}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{mouse}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{xenopus}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{sea urchin}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{cockroach}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{drosophila}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{dictyostel}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{schistosom}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{archaeoglo}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	HMGRclustalw{pseudomonas}	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE
VRN1ARGMA	Consensus	FLDKELTGLN EALPFLLI DLSRASATAK FALSSNSQDE

FIG. 32L

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ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{chinese2}	VLANYFVMT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{syrhahamst}	VLANYFVMT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	VLANYFVMT	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{rat}	VLANYFVMT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	VLANYFVMT	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{rabbit}	VLANYFVMT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	VLANYFVMT	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{human}	VLANYFVMT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{mouse}	VLANYFVMT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	VLANYFVMT	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{kenopus}	VLANYFVMT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	VLANYFVMT	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{sea urchin}	LIANYFVMT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	VLANYFVMT	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{cockroach}	VLANYFVMT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	VLANYFVMT	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{drosophila}	VLANYFVMT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	VLANYFVMT	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{dictyostel}	ILIPKFAKV
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	VLANYFVMT	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{schistosom}	DMTGMFLKT
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{archaeoglo}	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	HMGRClustalW{pseudomonas}	
ILGPTTLD LV.ECLVIG VGTMSGVRQL EIMCCFGCMS	Consensus	VLANYFVMT

FIG. 32N



HMGRClustalW {methanobac}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {methanococ}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {halobacter}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {sulfolobus}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {yeast2}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {yeast1}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {phycomyces}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {fusarium}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {candida}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {dictyostez}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {wheat1}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {rice}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {corn}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {wheat3}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {wheat2}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {soybean}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {rubberrez3}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {rosyperiwi}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {tomato}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {woodtobacc}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {potato}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {radish}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {arabadopst1}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {cucumisamel}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {rubberrez2}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {rubberrei}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {camptothec}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {arabadops2}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF
HMGRClustalW {chineseham}	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF	FLNSVAVII MGLSVILTFV FIFNYNF.. GANWVN.DAF

FIG. 320

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Species	Accession	Consensus
HMGRclustalw{chinese-haz}	KMIMSLGLVL VHAHSRWIAD PSPQNST... TE.HSKVSLG	Consensus
LDEDVSKRIE		
HMGRclustalw{syrhianhamst}	KMIMSLGLVL VHAHSRWIAD PSPQNST... TE.HSKVSLG	
LDEDVSKRIE		
HMGRclustalw{rat}	KMIMSLGLVL VHAHSRWIAD PSPQNST... AE.QSKVSLG	
LAEDVSKRIE		
HMGRclustalw{rabbit}	KMIMSLGLVL VHAHSRWIAD PSPQNST... AD.NSKVSLG	
LDEDVSKRIE		
HMGRclustalw{human}	KMIMSLGLVL VHAHSRWIAD PSPQNST... AD.TSKVSLG	
LDEDVSKRIE		
HMGRclustalw{mouse}		
HMGRclustalw{xenopus}	KMIMSLGLVL VHAHSRWIAD PSPQNST... SISDHEVTTM	
LDDMBPKRIE		
HMGRclustalw{sea urchin}	KMIMRTGLVL VHAHSRWIAD PSPQNST... ELMRDMGLVD	
GNLITDKID		
HMGRclustalw{cockroach}	KVIMSAGLML VHAH.RWVRC	
HMGRclustalw{drosophila}	KLIMTTGLMA VHIYSREVSF ... AAT... TMVDKTLTPT	
LSLNVSNRT		
HMGRclustalw{dictyostel}	KPLPIPIQHN QQQQKQQPS	
HMGRclustalw{schistosom}	YGEQKKCLVS NKGVSSSTRK RSHSYSSGHS YVEYRMSVH	
NLIGVVPNP		
HMGRclustalw{archaeoglo}		
HMGRclustalw{pseudomonas}		

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HMGRclustalw{methanobac}
HMGRclustalw{methanococ}
HMGRclustalw{halobacter}
HMGRclustalw{sulfolobus}	.....	.....	.....
HMGRclustalw{yeast2}	SLPFIINVKD	IGNLSNQVII	SVLPKQYYTP LKKYHQIEDS
HMGRclustalw{yeast1}	SLPFIITSNA	SENFKEQAIIV	SVTPPLTYKIP IKSYQRIEDM
HMGRclustalw{phycomyces}	.....	.....	.....
HMGRclustalw{fusarium}	ASNPAYN.DA	FHHHFQGYGV	GGRMWGGILK SLEDPVLISKM
HMGRclustalw{candida}	TLYDAVA.DQ	IPIGSNGTLV	TLFPTRFFLP EKLSTQIEAV
HMGRclustalw{dictyostez}	.....	.....	.....
HMGRclustalw{wheat1}	.....	.....	.....
HMGRclustalw{rice}	.....	.....	.....
HMGRclustalw{corn}	.....	DEDFLVGS	G.....
HMGRclustalw{wheat3}	.....	.....	.....
HMGRclustalw{wheat2}	.....	.....	.....
HMGRclustalw{soybean}	.....	.....	.....
HMGRclustalw{rubberrez3}	.....	D.SMDVEE	Y.....
HMGRclustalw{rosyperiwi}	.....	E.GWEIEE	.....
HMGRclustalw{tomato}	.....	D.SWDE..	.....
HMGRclustalw{woodobacc}	.....	DECMDEED	E.....
HMGRclustalw{potato}	.....	D.SWDIED	E.....
HMGRclustalw{radish}	.....	D.SGDSER	.....
HMGRclustalw{arabadopsis1}	.....	D.AWDLAD	T.....
HMGRclustalw{cucumis mel}	.....	D.AWDLAD	.....
HMGRclustalw{rubberrez2}	.....	.....	.....
HMGRclustalw{rubberrez1}	.....	D.VMDLED	T.....
HMGRclustalw{camptothec}	.....	D.VWGVDD	DE.....
HMGRclustalw{arabadops2}	.....	.....	.....
HMGRclustalw{chinese ham}	PSVSLWQFFYL	SKMISMIDIEQ VVTLSLAFLT AVKYIFFEQA

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ESTLST	Consensus	PDSLTWDFY - SKMISMIDIEQ VVTLSTA-LT AVKXIFED-
HMGRclustaln{chinese2}	PSVSLWQFYL SKMISMIDIEQ VVTLSTAFLT AVKXIFEEQA	PSVSLWQFYL SKMISMIDIEQ VVTLSTA-LT AVKXIFED-
ET..ESTLSL		
HMGRclustaln{syr1anhamst}	PSVSLWQFYL SKMISMIDIEQ VVTLSTAFLT AVKXIFEEQA	PSVSLWQFYL SKMISMIDIEQ VVTLSTA-LT AVKXIFED-
ET..ESTLSL		
HMGRclustaln{rat}	PSVSLWQFYL SKMISMIDIEQ VVTLSTAFLT AVKXIFEEQA	PSVSLWQFYL SKMISMIDIEQ VVTLSTA-LT AVKXIFED-
ET..ESTLSL		
HMGRclustaln{rabb1t}	PSVSLWQFYL SKMISMIDIEQ VVTLSTAFLT AVKXIFEEQA	PSVSLWQFYL SKMISMIDIEQ VVTLSTA-LT AVKXIFED-
ET..ESTLSL		
HMGRclustaln{human}	PSVSLWQFYL SKMISMIDIEQ VVTLSTAFLT AVKXIFEEQT	PSVSLWQFYL SKMISMIDIEQ VVTLSTA-LT AVKXIFED-
ET..ESTLSL		
HMGRclustaln{mouse}	PSVSLWQFYL SKMISMIDIEQ VVTLSTAFLT AVKXIFEEQT	PSVSLWQFYL SKMISMIDIEQ VVTLSTA-LT AVKXIFED-
ET..ESTLSM		
HMGRclustaln{sea urchin}	PTMPLWEFYA TRLWPPTLDY IITAILATVL ASHYIFFSDI	PTMPLWEFYA TRLWPPTLDY IITAILATVL ASHYIFFSDI
ATYPKRVSI		
HMGRclustaln{cockroach}	.SIATWBDLT S....LRY FCTHCDTGVS YSRWSFASBG	.SIATWBDLT S....LRY FCTHCDTGVS YSRWSFASBG
EE..LPTVKL		
HMGRclustaln{drosophila}	ESGEIADIII KWL.T.MSADH IVISIVLIAL VKKICFDNR	ESGEIADIII KWL.T.MSADH IVISIVLIAL VKKICFDNR
DP..LPDOL		
HMGRclustaln{dictyostel}	..QDYIQPO	..QDYIQPO
IN.....		
HMGRclustaln{schistosom}	CHYKCMSTTF VIFVSLIILH LNNRYSERIS SFKHNSSENE	CHYKCMSTTF VIFVSLIILH LNNRYSERIS SFKHNSSENE
VFPVLVHITA		
HMGRclustaln{archaeoglo}		
HMGRclustaln{pseudomonas}		

FIG. 32U

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HMGRclustalw{methanobac}					
HMGRclustalw{methanococ}					
HMGRclustalw{halobacter}					
HMGRclustalw{sulfolobus}					
HMGRclustalw{yeast2}	AIRDQFISKL	LFFAFAVSIS	INVYLLNAAK	IHTGYMNFQ.	
HMGRclustalw{yeast1}	AIRDRFVSKL	VLSATVCASAV	INVYLLNAAR	IHTSYTADQL	
HMGRclustalw{phycomyces}					
HMGRclustalw{fusarium}	INGYLFNVAR	WGIKDPNVPE	HNIDRNETLAR	AREFNDTGS.	
HMGRclustalw{candida}	AARDKYISKF	ILFAFAVSAS	INVYLLNVAR	IHTTRLEDA.	
HMGRclustalw{dictyostez}					
HMGRclustalw{wheat1}					
HMGRclustalw{rice}					
HMGRclustalw{corn}					
HMGRclustalw{wheat3}					
HMGRclustalw{wheat2}					
HMGRclustalw{soybean}					
HMGRclustalw{rubbertree3}					
HMGRclustalw{rosypertiwi}					G.
HMGRclustalw{tomato}					G.
HMGRclustalw{woodtobacc}					G.
HMGRclustalw{potato}					G.
HMGRclustalw{radish}					
HMGRclustalw{arabadopsis1}					
HMGRclustalw{cucumisamel}					
HMGRclustalw{rubbertree2}					
HMGRclustalw{rubbertree1}					
HMGRclustalw{campctothec}					
HMGRclustalw{arabadopsz}					
HMGRclustalw{chineseham}	KM.PITSPV	VTPKAPDNC	CRRREPLTVR	SEKLTSSVEEE	PGVSDRKVE

FIG. 32V

HMGRclustalw{chinese2}	KN..PITSPV VTPKAPDNC CRREPLTVR SEKLSVEEE
PGVSQDRKVE	KN..PITSPV ATPKAPDNC CRREPVLRR NEKLSVEEE
HMGRclustalw{syrhamst}	KN..PITSPV VTPKAPDNC CRREPLTVR NOKLSVEED
PGVNQDRKVE	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
PGVNQDRKVE	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{rabbit}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
AGMSQDRKVE	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{human}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
TMNRERKVE	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{mouse}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{xenopus}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
S..SKEBTEA	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{sea urchin}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
TSRTQACQTD	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{cockroach}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
LATAVKVEFF	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{drosophila}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
TENSAVRTL	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{dictyostel}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{schistosom}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
INSQLRNINI	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{archaeoglo}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
HMGRclustalw{pseudomonas}	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
Consensus	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED
SQDRKVE	KN..PITSPV VTPKAPDNC CRREPVLRR NOKLSVEED

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VIKPBLVETE SAS RATEVLG.A .SGTSPVVA
MIBC NOSLDCREVL
TVP CAAAPVDCPLP
LVTC PPANISTKTLI
LIDN NRYAAPRSASA
LVTC SPBTP
LVTC PPBPPBS
PCAAATTL GCVWPPBPVR
PATTL GCTAVPPBPAT
PATTL GCAVPAPPAR
TNCTTL GCAVPPBSVP
PTG ACAAPSLDCS
SSGS AAAPSRQHAQA
GQG GSRRAA
KGKSVNVE DLKQEIIAT VDKGEIQP . .
 LKPKKKKASK TAVSVPKAVV VKDSEITKSS
 LPLGEYVPT PMRTQPSTPA ITDDEAEG . .
 TAPVQKASTP VLTNKTVIS GSKVKSLSA
 LVVQOKSATI EFSETRSMBA SSGLETPVTA

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Species	Accession	Consensus	Alignment
Chinese hamster	VIKPLVETE SAS.....	Consensus
Syrian hamster	VIKPLVETE STS.....		
Rat	VIKPLVAEAE TSG.....		
Rabbit	VIKPLVAETD SPH.....		
Human	VIKPLVAETD TPN.....		
Mouse	.....	
Xenopus	VIKPLPLETS P.....		
Sea urchin	PVTASPRNSR SSSPVSSHV KPARFTIGSS		
Worm	ETRDDELTTTR GMDG...W VEVSSPVEHK		
Drosophila	LTFTIEDQSSA N.....		
Dictyostelium	.....SGKEQ EQ.....		
Schistosoma	PRIKETLISD QVKQSPVLPK FSKDNDIBL		
Archaeoglobus		
Pseudomonas		

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FIG. 32AA

700	HMGRclustalw{methanobac	GR. IKLYEI E. RHVPVDEA VRIRREFIE. RTGCVK
.. LEHVSNS	HMGRclustalw{methanococ	GE. IKPYQL D. KMFGSKIA TEIRRKPIE. KKVIGIE
.. FKHCNYS	HMGRclustalw{halobacter	GD. LRHEI E. AHADADTA AEARPLVE. SQSGAS
.. LDAVGNYG	HMGRclustalw{sulfolobus	GE. ISFHEV D. NLEANAA MVARRLATE. KIVGVG
.. LPSIGSTV	HMGRclustalw{yeast2}	G. KLPYSL EKKLEDTTRA VLVRRKATST LAESPILVS.
.. EKLPRN	HMGRclustalw{yeast1}	G. KLPYAL EKKLGDTTRA VAVRRKATSI LAEAPVLAS.
.. DRLPYKN	HMGRclustalw{phycomyces	.....
.. LDRSKLPYEN	HMGRclustalw{fusarium}	G. KIPGYAL EKTLDGDTTRA VKIRRSIAR NKAADITHS
HMGRclustalw{candida}	G. KLPYAL EKQLGDNLRA VAIRRKAISD LADAPVLRS.	
.. NKLPYLH	HMGRclustalw{dictyostez2}	A. VVAAXEK AATSGEDPSS IQPVVPPTSN LDFEGSLTN.
.. LPVDH	HMGRclustalw{wheat1}	.....
HMGRclustalw{rice}	G. ALPSHRL ESRLGDCRRA ARLRREALR. RVTGRG	
.. VEGLPFDG	HMGRclustalw{corn}	G. KVPYAL EARLGDCRRA AGIRREALR. RITGRD
.. IEGLPLDG	HMGRclustalw{wheat3}	.....
.....	HMGRclustalw{wheat2}	.....
HMGRclustalw{soybean}	.....
.. LEGPLBDG	HMGRclustalw{rubbertre3}	G. SIPSYSL ESKLGNCRA ALIRRETLQ. RMSGRS
.. LEGLPLEG	HMGRclustalw{rosyperiwi}	G. KIPSYSL ESKLGDCRRA AGIRREALQ. RITGKS
.. LEGLPLEG	HMGRclustalw{tomato}	G. KIPSYSL ESKLGDCRRA ASIRKEVVMQ. RITGKS
.. LEGLPLEG	HMGRclustalw{woodtobacc}	G. KMPYSYL ESKLGDCRRA ASIRKEALQ. RITGKS
.. LEGLPLEG	HMGRclustalw{potato}	G. KTPYSYL ESKLGDCMRA ASIRKEALQ. RITGKS
.. IEGLPLDG	HMGRclustalw{radish}	G. VVPYSYL ESRLGDCRRA ASIRREALQ. RLTGRS
.. IEGLPLDG	HMGRclustalw{arabadopsi1}	G. VIPYSYL ESRLGDCRRA ASIRREALQ. RVTGRS
.. IHGLPFEFEG	HMGRclustalw{cucumisamel}	G. SVPSYSL ESKLGDPKRA ASIRREALQ. RTTGRS
.....	HMGRclustalw{rubbertre2}	.....
.....	HMGRclustalw{rubbertre1}	G. KIPSYSL ESKLGDCRRA AIRREALQ. RMTTRS
.. LEGLPVEG	HMGRclustalw{camptothec}	G. TTPSYAL ESKLGDSHRA AIRREALQ. RMTKKS
.. LAGLPBDG	HMGRclustalw{arabadops2}	G. TIPSYSL ETKLGDCRRA AIRREAVQ. RITGKS
.. LTGLPLEG	HMGRclustalw{chineseham}	K. HIPAYKL ETLMEHBERG VSIRROLST K. LPBSS.
.. LQYLPYRD		

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FIG. 32CC

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750
HMGRCIustalW{methanobac} IDMERASRN IENPIGVQI PLGVAGPLRV RGEHADGEYY
VPLATSEGAL
HMGRCIustalW{methanococ} IDEEMAMKKN IENMIGAIOI PLGFAGPLKI NGEYAKGEFY
IPLATTEGAL
HMGRCIustalW{halobacter} FPAEAAES.A IENMVGSIOV PMGVAGBPVSV DGSVAAGEKY
LPLATTEGAL
HMGRCIustalW{sulfolobus} IDYSEIKKKN AENVIGAIOI PLGIVGPPIRV NGDYAKGDFY
VPMATTEGAL
HMGRCIustalW{ yeast2} YDYDRVFGAC CENVIGYMPI PVGVIGPLII DGT...SYH
IPMATTEGCL
HMGRCIustalW{ yeast1} YDYDRVFGAC CENVIGYMBL PVGVIGPLVI DGT...SYH

[illegible]

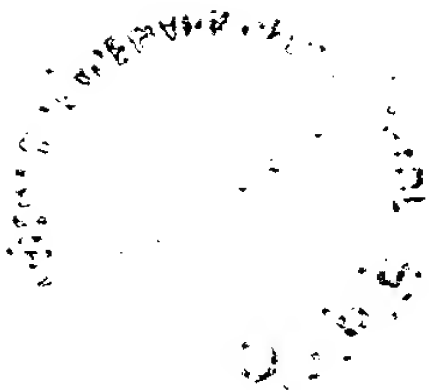
FIG. 32FF

Accession	Gene	Species	Protein	Accession	Gene	Species	Protein
VASVNRGCSV	ITRAGGATVR	VTGDSMT	RA	PVIRTGSSVE	ALOLREWIYE	HMGRClustalw	{methanobac}
VASVNRGCSI	ITKCGGATVR	VIDDKMT	RA	PCLKTKKSVD	AIKVRDWIRE	HMGRClustalw	{methanococ}
LASVNRGCSV	INSAGGATAR	VLKSGMT	RA	PVFRVADVAE	AEALVSWTRD	HMGRClustalw	{halobacter}
IASVNRGIKA	VTLSSGVRAK	VLKDEMT	RA	PVKFCDISIEQ	IPNFKFIEE	HMGRClustalw	{sulfolobus}
VASAMRGCKA	INAGGATTV	LTKDGMT	RG	PVVRFPITLIR	SGACKIWIDS	HMGRClustalw	{yeast1}
VASAMRGCKA	INAGGATTV	LTKDGMT	RG	PVVRFPITLIR	SGACKIWIDS	HMGRClustalw	{yeast2}
VASTARGCKA	INAGGASTI	VIADGMT	RG	PCVEFPITLIR	AAACKIWIEN	HMGRClustalw	{phycomyces}
VASASRGCKA	INSGGATTV	LTADGMT	RG	PCVAFFETLER	AGAAKIWLDS	HMGRClustalw	{fusarium}
VASAMRGCKA	INLGGGVTTV	LTKDGMT	RG	PCVKFPISLKR	AGCKIWLDS	HMGRClustalw	{candida}
VASTHRGAKA	ITKSGGAKTV	LTQSGMT	RA	PVCRITPSSIR	AGELKOWIEN	HMGRClustalw	{dictyostez}
.....	.....	.....	.....	.....	.....	HMGRClustalw	{wheat1}
VASVNRVQG	HLVSGGAFSV	LLRDAMS	RA	PAVKILPCPMR	AAELKAFAEA	HMGRClustalw	{rice}
VASTNRGCKA	IAESGGATSV	VLRDAMT	RA	PVARFPITARR	AAELKAFLED	HMGRClustalw	{corn}
.....	.....	.....	.....	.....	.....	HMGRClustalw	{wheat3}
.....	.....	.....	.....	.....	.....	HMGRClustalw	{wheat2}
.....	.....	.....	.....	.....	.....	HMGRClustalw	{soybean}
VASANRGCKA	IYASGGATSV	LLRDGMT	RA	PVVRFPITAKR	AAELKFFMED	HMGRClustalw	{rubbertree3}
VASTNRGCKA	ILASGGANSV	LLRDGMT	RA	PVVRFGTAKR	AAELKFFMED	HMGRClustalw	{rosyperiwi}
VASTNRGCKA	IYASGGATCI	LLRDGMT	RA	PCVRFGTAKR	AAELKFFMED	HMGRClustalw	{tomato}
VASTNRGCKA	IYASGGATSV	LLRDGMT	RA	PCVRFGTAKR	AAELKFFMED	HMGRClustalw	{woodtobacc}
VASTNRGCKA	IFVSGGADSV	LLRDGMT	RA	PVVRFTTAKR	AAELKFFVED	HMGRClustalw	{potato}
VASTNRGCKA	MYVSGGATST	VLKDGMT	RA	PVVRFPASARR	AAELKFFLEN	HMGRClustalw	{radish}
VASTNRGCKA	MFISGGATST	VLKDGMT	RA	PVVRFPASARR	AAELKFFLEN	HMGRClustalw	{arabadosis1}
VASTNRGCKA	IYASGGATSM	LLKDGMT	RA	PVVRFGSARR	AAELKFFLED	HMGRClustalw	{cucumismel}
.....	.....	.....	.....	.....	.....	HMGRClustalw	{rubbertree2}
VASTNRGCKA	IYLSGGATSV	LLKDGMT	RA	PVVRFPASATR	AAELKFFLED	HMGRClustalw	{rubbertrei}
VASTNRGCKA	IFACGGATSV	LLRDAMT	RA	PVVRFGSARR	AAELKFFLEN	HMGRClustalw	{camptothec}
VASTNRGFKA	IHTLSSGAFSV	LVKDAMT	RA	PVVRFPASARR	AAELKFFLED	HMGRClustalw	{arabados2}
VASTNRGCSA	IGLGGGASSR	VLADGMT	RG	PVVRTPRACD	AAELKFFLED	HMGRClustalw	{chineseham}

FIG. 3266

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VAATNRGCKA IGLGGASSR VLADGMT.RG PVVRLPRACD	HMGRclustalw{chinese2}	SAEVKAWLET
VAATNRGCKA IGLGGASSR VLADGMT.RG PVVRLPRACD	HMGRclustalw{syrilamhamst}	SAEVKAWLET
VAATNRGCKA ISLGGASSR VLADGMS.RG PVVRLPRACD	HMGRclustalw{rat}	SAEVKAWLET
VAATNRGCKA ICLGGASSR VLADGMT.RG PVVRLPRACD	HMGRclustalw{rabbit}	SAEVKAWLET
VAATNRGCKA IGLGGASSR VLADGMT.RG PVVRLPRACD	HMGRclustalw{human}	SAEVKAWLET
.....	HMGRclustalw{mouse}	.....
VAATNRGCKA IMLGGAKSR VLADGMT.RG PVVRLPTACD	HMGRclustalw{xenopus}	AAEVKAWLDS
VAATNRGCKA LRSAGGHSV LIGDGMT.RG PLVRLPSAQE	HMGRclustalw{sea urchin}	AGAIKQWLEV
VAATNRGCKA LMRG.VTSR IVADGMT.RG PVVRFPNIDR	HMGRclustalw{cockroach}	ASEAMLMQV
VAATNRGCKA LSVRG.VRSV VEDVGMT.RG PCVRFPSVAR	HMGRclustalw{drosophila}	AAEAKSWIEN
VAATHRGCKA ITESGAKCT ITSRGMT.RG PVVRFSDIVK	HMGRclustalw{dictyostel}	ASEFVSWIND
VAATNRGCKA IFLAGIKSV VVRDQMT.RA PVVWFPSIID	HMGRclustalw{schistosom}	SVKCIAWIDS
VAASNAARM ARESGGFTTD YTGSLMIGQI QVTKLTPNA	HMGRclustalw{archaeoglo}	AKFVLRQKD
VAAASYMAKL ARANGGFTTS SSAPLMHAQV QIVGIQDPLN	HMGRclustalw{pseudomonas}	ARTSLLRKD
VAATNRGCKA I-LSGGATSV VLADGMT-RA PVVRFPSAKR	Consensus	AAELKFWLED



850	HMGRclustalw{methanobac}	NM.DATREE AESTTRHGKL VKIDPI...	IVAGSYVPR
	FVYTTGDSMG	NF.ERIKEV AESTTRHGKL IKIEPI...	LIVGRNLYPR
	HMGRclustalw{methanococ}	NF.ERIKEV AESTTRHGKL IKIEPI...	LIVGRNLYPR
	FVEKTTGDAMG	NF.AATKEA AESTTRHGKL LDVTP...	YVVGNSVYLR
	FRYDTKDAMG	NL.EKIRNI ANSTSHHGKL KSITP...	EVLGNVWVLR
	HMGRclustalw{sulfolobus}	EEGÖNSIKKA FNSTRFARL ÖHIQT...	CLAGDLEMR
	FSPETGDAMG	EEGÖNAIKKA FNSTRFARL ÖHIQT...	CLAGDLEMR
	HMGRclustalw{yeast1}	EG.NDIVTNA FNSTRFARL RKLKI...	ALAGKLVFIR
	FRTTGDAMG	EAGÖMMKKA FNSTRFARL ÖSMKT...	ALAGTNLYIR
	HMGRclustalw{candida}	DEGÖEEMKKA FNSTRFARL ÖHLQT...	ALAGDLEFIR
	FRTVTGDAMG	QENFYÖVASA FNSTRFARL KSIKV...	VIAGRLVYLR
	FKSSTGDAMG	PANFELTAAV FNRSSRFARL ÖDIRC...	ALAGRNLYMR
	HMGRclustalw{rice}	PANFDTLSVV FNRSSRFARL ÖGVQC...	AMAGRNLVYMR
	FSCITGDAMG	.....	.....
	HMGRclustalw{wheat1}	.....	.....
	.....GDAMG	.....	.....
	HMGRclustalw{wheat2}	.....	.....
	.....GDAMG	.....	.....
	HMGRclustalw{soybean}	.....	.....

	HMGRclustalw{rubbertree3}	PDNFDTIAVV FNRSSRFARL ÖSVQC...	AIAGKNLYMR
	FSCSTGDAMG	TÖNFETISVV FNRSSRFARL ÖSVQC...	AIAGKNLYIR
	HMGRclustalw{rosyperiwi}	PIKEESLANV FNRSSRFARL ÖRIQC...	AIAGKNLYMR
	HMGRclustalw{tomato}	PIKEETLAAV FNRSSRFARL ÖRIQC...	AIAGKNLYMR
	LCCSTGDAMG	.....	.....
	HMGRclustalw{woodtobacc}	PVKFEETLAAV FNRSSRFARL ÖRIQC...	AIAGKNLYMR
	FVCSSTGDAMG	PLNFETLSLM FNRSSRFARL ÖGIQC...	AIAGKNLYIT
	HMGRclustalw{potato}	PENFETLAAV FNRSSRFARL ÖVVC...	TLAGKNAYVR
	FSCSTGDAMG	PENFDTLAAV FNRSSRFARL ÖVVC...	TLAGKNAYVR
	HMGRclustalw{arabadopsi1}	PSNFDTLAAV FNRSSRFARL ÖSIRC...	SIAGKNLYVR
	FCCSTGDAMG	.....	.....
	HMGRclustalw{cucumismel}	.....	.....
	FCCSTGDAMG	.....	.....
	HMGRclustalw{rubbertree2}	.....	.....

	HMGRclustalw{rubbertree1}	PDNFDTLAAV FNRSSRFARL ÖGIKC...	SIAGKNLYIR
	FSCSTGDAMG	PLNFETLAAV FNRSSRFARL ÖNIKC...	AIAGKNLYMR
	YSCSTGDAMG	PSNFERTSLI FNRSSRFARL ÖSITC...	TIAGRNLYPR
	FACSTGDAMG	PEGFAVIXDA FDTSTRFARL ÖKLHV...	TMAGRNLVYIR
	FÖSKTGDAMG

FIG. 32HH

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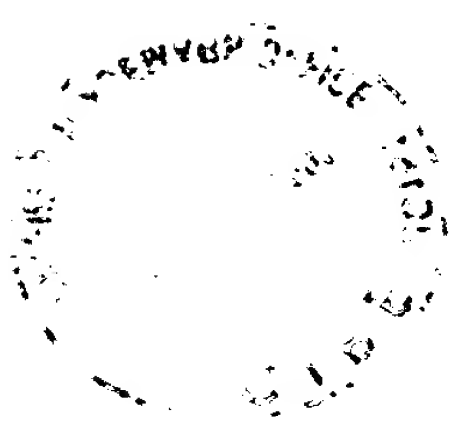


FIG. 32II

HMGRclustalw{chinese2}	PEGFAVIKDA	FDSTSRFART	QKLHV.....	TMAGRNLVIR	
FQSKTGDMG	HMGRclustalw{syrhahamst}	PEGFAVIKDA	FDSTSRFART	QKLHV.....	TMAGRNLVIR
FQSKTGDMG	HMGRclustalw{rat}	PEGFAVKEA	FDSTSRFART	QKLHV.....	TLAGRNLVIR
LQSKTGDMG	HMGRclustalw{rabbic}	PEGFAVIKDA	FDSTSRFART	QKLHI.....	SMAGRNLVIR
FQSRSGDAMG	HMGRclustalw{human}	SEGFAVIKEA	FDSTSRFART	QKLHT.....	SIAGRNLVIR
.....	HMGRclustalw{mouse}	.....	.....	.....	.....
FQSKTGDMG	HMGRclustalw{xenopus}	AEGFKVIKDA	FDSTSRFART	GRLQN.....	CVAGRNLVIR
FKALTGDAMG	HMGRclustalw{sea urchin}	PENFAAIKER	FESTSRFART	KSIQT.....	ALAGRYMFLR
FIAITGDAMG	HMGRclustalw{cockroach}	PYNFEQIKKN	FDSTSRFART	SKIHI.....	RVAGRHLFIR
FVAITGDRMG	HMGRclustalw{drosophila}	DENYRVKTE	FDSTSRFART	KDCHI.....	AMDGPQLVIR
FKCDTGDMG	HMGRclustalw{dictyostel}	TDNYQATKAV	FDSTSRFART	SAIKC.....	TIAGRSVIR
FAARTGDAMG	HMGRclustalw{schistosom}	EEGFQTLKSA	FDKTSAHVNL	LSVFA.....	CPAGRYIHIR
LIVDKDAMG	HMGRclustalw{archaeoglo}	EIERANEDD	PMLVNLGGCC	KDIEAR.VID	TIMGKMLIVH
LIVDVRDAMG	HMGRclustalw{pseudomonas}	EIETLANRKD	QLNLSLGGCC	RDIEVHTFAD	TBRGPMLVAH
FSCSTGDAMG	Consensus	PENFETLK-A	FNSTSRFART	QSIQC-----	AIAGRNLVIR
(continued)	NADH binding domain 1				



900	HMGRCJUSALW{methanobac}	MNMVTIATER	ATELT..R	ETGAHV..IA	LSGNLCCTDKK
	PAVNLIIEGR				
	HMGRCJUSALW{methanococ}	MNMVTIATER	ACNFIEGELK	KEGIFVKIVA	VSGNACVDKK
	PSGMNLINGR				
	HMGRCJUSALW{halobacter}	MNMVTIATER	VCGVE...A	ETAASL..VA	LSGNLCSDKK
	PAINAVEGR				
	HMGRCJUSALW{sulfolobus}	MNMVTIATER	VCEFIE....	ENFSSADCLA	VSGNMCSDDK
	QTNVNSLFR				
	HMGRCJUSALW{yeast2}	MNMISKVEY	SLKQWVEEY..	GWEDMEVVS	VSGNYCTDKK
	PAINWIEGR				
	HMGRCJUSALW{yeast1}	MNMISKVEY	SLKQWVEEY..	GWEDMEVVS	VSGNYCTDKK
	PAINWIEGR				
	HMGRCJUSALW{phycomyces}	MNM..			
				
	HMGRCJUSALW{fusarium}	MNMISKVEH	ATSVMANDG..	GFDDMQIIS	VSGNYCTDKK
	AAATNMWIDGR				
	HMGRCJUSALW{candida}	MNMISKVEY	ATKQMTVEF..	GWDDMMVVS	VSGNYCTDKK
	PAVNWINGR				
	HMGRCJUSALW{dictyostez}	MNMISKVEK	ATEVITEY..	FPEMEVLS	LSGNVCTDKK
	PSSINWLEGR				
	HMGRCJUSALW{wheat1}	MNMVSKGVEN	VLGYIRNN..	FPDMDVIS	ISGNYCSDKK
	ATAVNWIDGR				
	HMGRCJUSALW{rice}	MNMVSKGVEN	VLGYLQNV..	FPDMDVIS	VSGNYCSDKK
	PTAVNWIEGR				
	HMGRCJUSALW{corn}	MNMVSKGVQV	VLDFLQDD..	FHDMVIS	ISGNFCSDKK
	PSAVNWIEGR				
	HMGRCJUSALW{wheat3}	MNMVSKGVQV	VLDFLQDD..	FPDMDVIS	ISGNFCSDKK
	PAVNWIEGR				
	HMGRCJUSALW{wheat2}	MNMVSKGVQV	VLDFLEED..	FPDMDVVS	ISGNFCSDKK
	SAAVNWIEGR				
	HMGRCJUSALW{soybean}	.....		
				
	HMGRCJUSALW{rubbertree3}	MNMVSKAVQV	VIDYLQND..	FPDMDVIG	LTGNFCADKK
	AAAVNWIEGR				
	HMGRCJUSALW{rosyperiwi}	MNMVSKGVQV	VLDFLQTD..	FPDMDVLG	ISGNFCADKK
	PAVNWIEGR				
	HMGRCJUSALW{tomato}	MNMVSKGVQV	VLDFLQNE..	FPDMDVIG	ISGNFCSDKK
	PAVNWIEGR				
	HMGRCJUSALW{woodobacc}	MNMVSKGVQV	VLDFLQNE..	FPDMDVIG	ISGNFCSDKK
	PAVNWIEGR				
	HMGRCJUSALW{potato}	MNMVSKGVQV	VLDFLQSE..	FPDMDVIG	ISGNFCSDKK
	PAVNWIEGR				
	HMGRCJUSALW{radish}	MNMVSKGVQV	VLDFLTED..	FPDMDVIG	ISGNFCSDKK
	PAVNWIEGR				
	HMGRCJUSALW{arabadosis1}	MNMVSKGVQV	VLDFLTDD..	FPDMDVIG	ISGNFCSDKK
	PAVNWIEGR				
	HMGRCJUSALW{cucumisamel}	MNMVSKGVQV	VLDFLQHD..	FSDMEVIG	ISGNFCADKK
	PAVNWIEGR				
	HMGRCJUSALW{rubbertree2}	.....	.....	FADMDVIG	ISGNFCSDKK
	PAVNWIEGR				
	HMGRCJUSALW{rubbertree1}	MNMVSKGVQV	VLDFLQSD..	FSDMDVIG	ISGNFCSDKK
	PAVNWIEGR				
	HMGRCJUSALW{campothec}	MNMVSKGVQV	VLDFLQDD..	FPDMDVIG	ISGNYCSDKK
	PAVNWIEGR				
	HMGRCJUSALW{arabados2}	MNMVSKGVQV	VLDFVKSE..	FPDMDVIG	ISGNYCSDKK
	ASAVNWIEGR				
	HMGRCJUSALW{chineseham}	MNMVSKGTER	ATKLQEEF..	FPEMQIILA	VSGNYCTDKK
	PAINWIEGR				

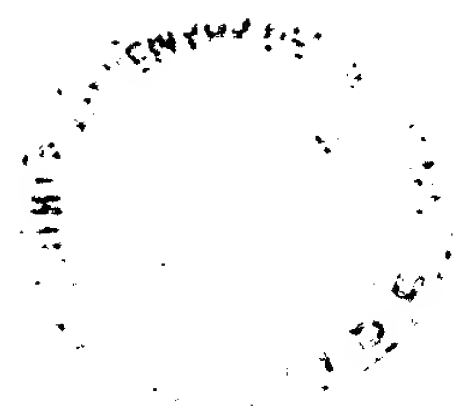
FIG. 32J



FIG. 32KK

HMGRClustalW{chinese2}	MNMISKGTEK ALTKQEF..	..FPDMQILA VSGNYCTDKK
HMGRClustalW{syrhahamst}	MNMISKGTEK ALVKQEF..	..FPDMQILA VSGNYCTDKK
HMGRClustalW{rat}	MNMISKGTEK ALTKQEG..	..VPBQILA VSGNYCTDKK
HMGRClustalW{rabbit}	MNMISKGTEK ATSKLHEY..	..FPDMQILA VSGNYCTDKK
HMGRClustalW{human}	MNMISKGTEK ATSKLHEY..	..FPDMQILA VSGNYCTDKK
HMGRClustalW{mouse}	.....EK ALTKQEF..	..FPDMQILA VSGNYCTDKK
HMGRClustalW{xenopus}	MNMISKVTEQ ALARLQEE..	..FPDLHLVA VSGNYCTDKK
HMGRClustalW{sea urchin}	MNMISKGTEQ ALHALQTM..	..FPNIEIMS LSGNYCTDKK
HMGRClustalW{cockroach}	MNMISKGTEV ALAYVQV..	..YPDMEITS LSGNYCTDKK
HMGRClustalW{drosophila}	MNMVSKALRW PFAEFTLH..	..FPDMQIIS LSGNFCCDKK
HMGRClustalW{dictyostel}	MNMVSKGVEA VLEHLKII..	..FPDMTILS LSGNMCTDKK
HMGRClustalW{schistosom}	MNMVSKATDS ALHCLKKY..	..FSNMQVIS LSGNMCTDKK
HMGRClustalW{archaeoglo}	ANAVNTMCEK VAPFIERITG	..GKVYLRIS NLAAVRLARA
HMGRClustalW{pseudomonas}	ANTVNTMAEA VAPLMEAITG	..GQVRLRIS NLADLRLARA
QVRIIPQLE		
PAAVNWIEGR	consensus	MNMVSKGVEN VL--LQED--
		-GFPDMVIS ISGNYCTDKK

NADH binding domain 1 (concluded)



950
HMGRclustalw{methanobac
AG.SMG.FN
HMGRclustalw{methanococ
SN.SMG.FN
HMGRclustalw{halobacter
AA.SLG.FN
HMGRclustalw{sulfolobus
AG.SLSQFN
HMGRclustalw{yeast2
AG.SVGFN
HMGRclustalw{yeast1
AG.SVGFN
HMGRclustalw{phycomyces
.....
HMGRclustalw{fusarium
AG.SVGFN
HMGRclustalw{candida
AG.SVGFN
HMGRclustalw{dictyostez
AG.SIGFN
HMGRclustalw{wheat1
AG.ATGFN
HMGRclustalw{rice
AG.ATGFN
HMGRclustalw{corn
AG.ATGFN
HMGRclustalw{wheat3
AG.ATGFN
HMGRclustalw{wheat2
AG.ATGFN
HMGRclustalw{soybean
AG.ATGFN
HMGRclustalw{rubbertre3
AG.ATGFN
AG.SLGFN
HMGRclustalw{rosypertwi
AG.ATGFN
HMGRclustalw{tomato
AG.ATGFN
HMGRclustalw{woodtobacc
AG.ATGFN
HMGRclustalw{potato
AG.ATGFN
AG.ATGFN
HMGRclustalw{radish
AG.SLGFN
HMGRclustalw{arabadopst1
AG.SLGFN
AG.SLGFN
HMGRclustalw{cucumisml
AG.ATGFN
HMGRclustalw{rubbertre2
AG.ATGFN
HMGRclustalw{rubbertre1
AG.ATGFN
AG.ATGFN
HMGRclustalw{camptothec
AG.ATGFN
HMGRclustalw{arabadopst2
AG.SLGFN
AG.SLGFN
HMGRclustalw{chineseham
GKTIWCEAVI PAKVVRVVK TTEAMIDVN INKMLVGSAM

901
GKSITAEITV PGEWVESVK TTEAAVEVN TAKMLIGSAA
GKSIWAEVFL TEKEVNKVLK TTSQAIAEVN RLKMYIGSAI
GRSVTADVRI PREVEERLH TTPERGRELN TRKMLVGSAM
GKTVLAEALI KQDVIRNITH SNAQLIHIDIN LRKWLGTAR
GKSVAAEATI PGDVVKSVLK SDVSATVEIN ISKMLVGSAM
GKSVAAEATI PGDVVRKVLK SDVSATVEIN IAKMLVGSAM
.....
GKGVAAEALI PGEVRSVLK SDVDSLVEIN VAKMLIGSAM
GKSVAAEASI PKDAVVKVLK SSVKAAVDVN VNKMLIGSAM
GKSVAAEAVI SCDIVRDVLK TTEATVSLN IDKMLIGSAM
GKSVVCEATI KGRVQSVID TTEKTLVEIN IIKMLAGSAA
GKSVVCEALI KGDVQKVLK TTEKTLVEIN IIKMLAGSAA
GKSVVCEAVI GEEVKKVLK TDVQSLVEIN TIKMLAGSAA
GKSVVCEAVI REELTKVLK TNVQSLVEIN VIKMLAGSAA
GKSVVCEALI REEVEKVLK TNVQSLVEIN VIKMLAGSAA
.....LK TNVSATVEIN MLKMLAGSAA
GKSVVCEALI KEVVKKVLK TNVAATVEIN MIKMLTGSAA
GKSVVCEALI KEIVKTVLK TEVAATIEIN MVKMLAGSAI
GKSVVCEALI TEEVKKVLK TEVAATVEIN MLKMLTGSAM
GKSVVCEALI TEEVKKVLK TEVAATVEIN MLKMLTGSAM
GKSVVCEALI TEEVKKVLK TEVAATVEIN MLKMLTGSAM
GKSVVCEAVI RGEIVNKVLK TSVAATVEIN MLKMLAGSAA
GKSVVCEAVI KDEVVRKVLK TSVASLVEIN MLKMLTGSAM
GKSVVCEALI KEVVKKVLK TDVATLVEIN MLKMLAGSAA
GKSVVCEALI KEVVKKVLK TNVASLVEIN MLKMLAGSAA
GKSVVCEAVI KEVVKKVLK TNVASLVEIN MLKMLTGSAM
GKHVCEAFI KAEIVEKVLK TSVEATVEIN TLKMLVGSAM
GKTIWCEAVI PAKVVRVVK TTEAMIDVN INKMLVGSAM

FIG. 32LL

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FIG. 32MM

AG.SIGYN	HMGRclustalw{chinese2}	GKTVCEAVI	PAKVREVLK	TTTEAMIDVN	INKVLVGSAM
AG.SIGYN	HMGRclustalw{syrhamst}	GKTVCEAVI	PAKVREVLK	TTTEAMIDVN	INKVLVGSAM
AG.SIGYN	HMGRclustalw{rat}	GKTVCEAVI	PAKVREVLK	TTTEAMIDVN	INKVLVGSAM
AG.SIGYN	HMGRclustalw{rabbit}	GKTVCEAVI	PAKVREVLK	TTTEAMIDVN	INKVLVGSAM
AG.SIGYN	HMGRclustalw{human}	GKTVCEAVI	PAKVREVLK	TTTEAMIEVN	INKVLVGSAM
AG.SIGYN	HMGRclustalw{mouse}	GKTVCEAVI	PAKVREVLK	TTTEAMVDVN	INKVLVGSAM
AG.SIGYN	HMGRclustalw{kenopus}	GKSVCEAVI	PAKVREVLK	SSTEALVEVN	INKVFIGSAM
AG.SIGYN	HMGRclustalw{sea urchin}	GKSVCEATV	PAHIVQVLK	TSASALVDLN	INKVLVGSAM
AG.SIGYN	HMGRclustalw{cockroach}	GKSVCEAVI	PADIIKSVLK	TSVQALMDVN	ITKVLIGSAY
AG.SIGYN	HMGRclustalw{drosophila}	GKRVTECTI	SAATLRSVLK	TDAKTLVECN	KLKMMGGSAM
AG.SIGYN	HMGRclustalw{dictyostel}	GRSVCEAMI	TGDVVQRLK	TNVQATVDLN	IAKVLIGSAM
AGCPGMMGCN	HMGRclustalw{schistosom}	GKSVIAEAHL	SADVLAQVLH	TNAQRLARLT	HSKMWIGSAM
LM.....	HMGRclustalw{archaeoglo}	.....GEEV	EGIMLAYAFA	AADPFRCATH	NKGIMNGISA
LI.....	HMGRclustalw{pseudomonas}	TAFFSGEAVI	EGILDAYAFA	AVDPYRAATH	NKGIMNGIDP
Consensus		GKSVCEAVI	PAEVVRKVLK	TTVEATVELN	ILKNLVGSAM
SLGFFN					

K



1000
HMGRClustalW{methanobac}GDLVF
HMGRClustalW{methanococ}DGLVF
HMGRClustalW{halobacter}GDLVF
HMGRClustalW{sulfolobus}EDLYI
HMGRClustalW{yeast2}GDLRI
HMGRClustalW{yeast1}GDLRI
HMGRClustalW{phycomyces}
HMGRClustalW{fusarium}GALQI
HMGRClustalW{candida}GDLKV
HMGRClustalW{dictyostez}KDLVI
HMGRClustalW{wheat1}KDLHI
HMGRClustalW{rice}DDLHI
HMGRClustalW{corn}RDLHI
HMGRClustalW{wheat3}KDLHI
HMGRClustalW{wheat2}RDLHI
HMGRClustalW{soybean}RDLHI
HMGRClustalW{rubbertre3}RDLHI
HMGRClustalW{rosypertiwi}KDLHI
HMGRClustalW{tomato}KDLHI
HMGRClustalW{woodtobacc}KDLHV
HMGRClustalW{potato}KDLHV
HMGRClustalW{radish}KDLHI
HMGRClustalW{arabadosis1}KDLHI
HMGRClustalW{cucumisamel}RDLHI
HMGRClustalW{rubbertre2}KDLHI
HMGRClustalW{rubbertre1}KDLHI
HMGRClustalW{camptothec}KDLHV
HMGRClustalW{arabadosps2}DLHI
HMGRClustalW{chineseham}

AHAAIVTAL YIACGQDPAQ NVGSSNCITL MEASGPPTN...
AHSSNIVSAV FIATGQDPAQ NVSSHCHMTM ILPDGD...
AHASNIVSAV YLATGQDPAQ NVSSHCHITM MEAVNDG...
AHAGNIVSAI FIATGQDPAQ NVSSHCHITM MEAVNDG...
AHAGNIVSAI FIATGQDPAQ NVSSHCHITM MEAVNDG...
AHSSNIVSAI FIATGQDPAQ NVSSHCHITM MEAVNNG...
AHASNIVSAV FIATGQDPAQ NVSSQCITM MEAVNDG...
RHAASNIVSAV FIATGQDPAQ NVSSQCITM MEAVNDG...
AHASNIVSAV YLATGQDPAQ NVSSHCHITM MEAVNDG...
AHASNIVSAV YIATGQDPAQ NISSHCHITM MEAVNDG...
AHASNIVSAV FIATGQDPAQ NISSHCHITM MEAVNDG...
AHASNIVSAI FIATGQDPAQ NVSSQCITM MEAVNDG...
AHASNMTAV YIATGQDPAQ NVSSHCHITM MEAVNDG...
AHASNIVSAI FIATGQDPAQ NVSSHCHITM MEAVNDG...
AHASNIVSAI FIATGQDPAQ NVSSQCITM LEAVNG...
AHASNIVTAL FIATGQDPAQ NVSSQCIAM LEAVNDG...
AHASNIVTAL FIATGQDPAQ NVSSHCHITM LEVNAG...
AHASNIVTAL FIATGQDPAQ NVSSQCITM LEVNDG...
AHASNIVTAL FIATGQDPAQ NVSSQCITM LEAVNEG...
AHASNIVTAL YIATGQDPAQ NVSSNCITL MESING...
AQAANMTAV YLATGQDPAQ NVSSNCITL MTEED...
AHAAIVAAI FIATGQDPAQ VESANCITI MKNLN...
.....
AHAANLVTAV FIATGQDPAQ NVSSNCITL MKEVD...
AHAANLVTAL FIATGQDPAQ NVSSNCITL MKEVD...
AHFANIVTAL FIATGQDPAQ IVSSSGYTM TEVRG...
AHVANVAAI FIATGQDPAQ VEGANAITT AEVD...
AHYANIGAI FIATGQDEAH IVEGSLGITM AEVED...
AHYANIGAI FIATGQDEAH IVEGSLGVTI ABERK...

FIG. 32NN



FIG. 3200

.....EDLYI	HMGRClustalW{chinese2}	AHAANIVTAI	YIACGQDAAQ	NVGSSNCITL	MEASGPNT.
.....EDLYI	HMGRClustalW{syrhamst}	AHAANIVTAI	YIACGQDAAQ	NVGSSNCITL	MEASGPNT.
.....EDLYI	HMGRClustalW{rat}	LHAANIVTAI	YIACGQDAAQ	NVGSSNCITL	MEASGPNT.
.....EDLYI	HMGRClustalW{rabbit}	AHAANIVTAI	YIACGQDAAQ	NVGSSNCITL	MEASGPNT.
.....EDLYI	HMGRClustalW{human}	AHAANIVTAI	YIACGQDAAQ	NVGSSNCITL	MEASGPNT.
.....EDLYI	HMGRClustalW{mouse}	AHAANIVTAI	YIACGQDAAQ	NVGSSNCITL	MEASGPNT.
.....EDLYI	HMGRClustalW{xenopus}	AHAANIVTAI	YIACGQDAAQ	NVGSSNCITL	MEATGPNT.
.....EDLYI	HMGRClustalW{sea urchin}	AHAANIVTAI	YIATGQDAAQ	NIASSNCITL	METRGPKG.
.....GDLXL	HMGRClustalW{cockroach}	AHAANIVTAI	FIATGQDPAQ	NVGSSNCITL	MEPWGEDG.
.....KDLVY	HMGRClustalW{drosophila}	AHAANIVTAI	FIATGQDPAQ	NVTSSNCITL	MECWAENS.
.....EDLYM	HMGRClustalW{dictyostel}	AHAANIVTAI	FIATGQDCAQ	NVESSNCITL	MEACNDG.
.....QDLXI	HMGRClustalW{schistosom}	AHAANIVTAI	FIATGQDLAQ	VDBSSCITL	LEVBLSD.
.....DSLVA	HMGRClustalW{archaeoglo}	.....	IATGNDPRA	IEAGAHAYAA	IGG.YKPLTT
.....YEVDRKGNLV	HMGRClustalW{pseudomonas}	.....	VATGNDPRA	VEAGAHAYAC	RSGHYGSLLT
.....WEKDNNGHILV	Consensus	AHAANIVTAI	FIATGQDPAQ	NVESSNCITL	MEAVNDGN

D

1050	HMGRClustalW{methanobac	AVNLPDVPLA TVGGGTGLT ASECIDIMGV RGGG.....
	RVAFAEIVG	
	HMGRClustalW{methanococ	SVTLBPVPIG TVGGGTRVET QKECLEMLGC YGDN.....
	KALKFAEIVG	
	HMGRClustalW{halobacter	SVSIASLEV TVGGGTKLPT QSEGLDILGV SGGGP.AGS
	NADALAEICIA	
	HMGRClustalW{sulfolobus	SVTLPSLEV TVGGGTRLPT QKEALSIMGV YGSGNP.PGS
	NAKLAELIA	
	HMGRClustalW{yeast2	SVSMPSIEVG TIGGTVLEP QGAMLDILGV RGPHPTEPGA
	NAQOLARIVA	
	HMGRClustalW{yeast1	SVSMPSIEVG TIGGTVLEP QGAMLDILGV RGPHTAPGT
	NAQOLARIVA	
	HMGRClustalW{phycomyces	.....
	NAARLARIIG	
	HMGRClustalW{candida	SVSMPSIEVG TIGGTTIDP QGSMLELLGV RG.PADVGE
	NAQOLAKIVA	
	HMGRClustalW{dictyostez	SVTMPSIEVG TVGGGTHLPA QSACLDLTKI RGANLERPGA
	NSEQLARIVA	
	HMGRClustalW{wheat1	SVTMPPIEV.....
	
	HMGRClustalW{rice	SVTMPSIEVG TIGGTCIAS QACILNLLGV KGSNHGSPGA
	NAGRATIVA	
	HMGRClustalW{corn	SVTMPSIEVG TVGGGTQLAS QSACLDLGV RGASRDPRGS
	NAARLATVVA	
	HMGRClustalW{wheat3	SVTMPPIEV.....
	
	HMGRClustalW{wheat2	SVTMPPIEV.....
	
	HMGRClustalW{soybean	SVTMPSIEVG TVGGGTQLAS QSACILNLLGV KGASKESPBS
	NSRLLATIVA	
	HMGRClustalW{rubbertree3	SVSMPSIEVG TVGGGTQLAS QSACILNLLGV KGASKDSPBS
	NSRLLATIVA	
	HMGRClustalW{rosypertwi	SVTMPSIEVG TVGGGTQLAS QSACILNLLGV KGASKDSPGA
	NSRLLATIVA	
	HMGRClustalW{tomato	SVTMPSIEVG TVGGGTQLAS QSACILNLLGV KGANREAPGS
	NAARLATVVA	
	HMGRClustalW{woodbacc	SVTMPSIEVG TVGGGTQLAS QSACILNLLGV KGANREVPBS
	NAARLATIVA	
	HMGRClustalW{potato	SVTMPSIEVG TVGGGTQLAS QSACILNLLGV KGANRDAPGS
	NAARLATIVA	
	HMGRClustalW{radish	SVTMPSIEVG TVGGGTQLAS QSACILNLLGV KGASKESPBM
	NSRLLATIVA	
	HMGRClustalW{arabadosis1	SVTMPSIEVG TVGGGTQLAS QSACILNLLGV KGASTESPBM
	NAARLATIVA	
	HMGRClustalW{cucumisml	SVTMPSIEVG TVGGGTQLAS QSACILNLLGV KGASKESPBA
	NSRLLATIVA	
	HMGRClustalW{rubbertree2	SVTLPSIEVG TVGGGTQLAS QSACILNLLGV MGACKESPBS
	YSRLLATIVA	
	HMGRClustalW{rubbertree1	SVTMPSIEVG TVGGGTQLAS QSACILNLLGV KGANKESPBS
	NSRLLAIVA	
	HMGRClustalW{camptothec	SVTMPSIEVG TVGGGTQLAS QSACILNLLGV KGASKKEAPBS
	NAARLATIVA	
	HMGRClustalW{arabados2	SVSMPSIEVG TVGGGTQLAS QACILNLLGV KGSNNKPPGS
	NAQOLARIVA	
	HMGRClustalW{chineseham	SCTMPSIEIG TVGGGTMLP QOACLQMLGV QGACKDNPPGE
	NAQOLARIVC	

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FIG. 32PP



FIG. 3200

NARQIARIVA	HMGRClustalW{chinese2}	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{syrhahamst}	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{rat}	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{rabbit}	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{human}	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{mouse}	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{xenopus}	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{sea urchin}	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{cockroach}	SCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	TCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{drosophila}	TCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	TCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{dictyostel}	TCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	NARQIARIVC	TCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{schistosom}	TCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	PTEHLARIA	TCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{archaeoglo}	TCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
	HMGRClustalW{pseudomonas}	TCTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE
consensus		SVTMPSIEIG TVGGGTNLLP QQACIQMLGV QGACKDNPGE

NADH binding domain 2

HMGRClustalW (methanobac)	GAVALAGELSL MGATAAGHLA RAASELGRG
HMGRClustalW (methanococ)	AAVLAGELSL LGATAAGHLG KAHQELGR
HMGRClustalW (halobacter)	VGSLAGELSL LSALASRHL SABAELGR
HMGRClustalW (gulfobus)	STVLSGELML LAATSNKELG KAHAKLGRAM KV
HMGRClustalW (yeast2)	CAVLAGELSL CSATAAGHLV QSHMTNHRK
HMGRClustalW (yeast1)	CAVLAGELSL CAATAAGHLV QSHMTNHRKP
HMGRClustalW (phycomyces)	AAVLAGELSL CSATAAGHLV RAHMQHNRSA
HMGRClustalW (fusarium)	AAVLAGELSL CSATAAGHLV RAHMQHNRSA
SHDARLTGHD	
HMGRClustalW (candida)	SIVLSGELSL VSATAAGHLV QSHMQHNRAA
HMGRClustalW (dictyostez2)	AAVLAGELSL MSATAAGHLV RSHLKHNHRKT
SMTHNLPHSD	
HMGRClustalW (wheat1)	GSVAVAGRALT LAATAAGHLV KSHMMYNRSS
HMGRClustalW (rice)	GSVAVAGRALT LAATAAGHLV KSHMMYNRSS
HMGRClustalW (corn)	GGVLAGELSL LSATAAGHLV KSHMKYNRSS
HMGRClustalW (wheat3)	
HMGRClustalW (wheat2)	
HMGRClustalW (soybean)	GSVLAGELSL MSATAAGHLV NSHMKYNRSS
HMGRClustalW (rubbertree3)	GSVLAGELSL MSATAAGHLV NSHMKYNRSA
HMGRClustalW (rosyperiwi)	GSVLAGELSL MSASISAGHLV RSHMKYNRSS
HMGRClustalW (tomato)	GSVLAGELSL MSASISSGHLV NSHMKYNRST
HMGRClustalW (woodtobacc)	GSVLAGELSL MSASISAGHLV KSHMKYNRST
HMGRClustalW (potato)	GSVLAGELSL MSASISAGHLV KSHMKYNRSI
HMGRClustalW (radish)	GAVALAGELSL MSATAAGHLV RSHMKYNRSS
HMGRClustalW (arabadopis1)	GAVALAGELSL MSATAAGHLV RSHMKYNRSS
HMGRClustalW (cucumismel)	GSVLAGELSL MSATAAGHLV RSHMKYNRSS
HMGRClustalW (rubbertree2)	GSVLAGELSL MSATAAGHLV KSHMKYNRSS
HMGRClustalW (rubbertree1)	GSVLAGELSL MSATAAGHLV KSHMKYNRSS
HMGRClustalW (camptothec)	GSVLAGELSL MSATAAGHLV NSHMKYNRSN
HMGRClustalW (arabadop2)	GSVLAGELSL MSATAAGHLV KSHMKYNRSS
HMGRClustalW (chineseham)	GTVMAGELSL MAATAAGHLV RSHMVHNRSS

FIG. 32RR

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FIG. 32SS

HMGRclustalw{chinese2}	GTVMAGELSL MAALAAAGHLV RSHMVHNRSK INLOD.....
HMGRclustalw{syrhamst}	GTVMAGELSL MAALAAAGHLV RSHMVHNRSK INLOD.....
HMGRclustalw{rat}	GTVMAGELSL MAALAAAGHLV RSHMVHNRSK INLOD.....
HMGRclustalw{rabbit}	GTVMAGELSL MAALAAAGHLV KSHMHNRSK INLOD.....
HMGRclustalw{human}	GTVMAGELSL MAALAAAGHLV KSHMHNRSK INLOD.....
HMGRclustalw{mouse}	GTVMAGELSL MAALAAAGHLV RSHMVHNRSK INLOD.....
HMGRclustalw{xenopus}	STVMAGELSL MAALAAAGHLV KSHMVHNRSK INLOD.....
HMGRclustalw{sea urchin}	ATVMAGELSL MSALAAAGHLV KSHMKHNRSK LNIASPLPSI
DEVATHRSK	
HMGRclustalw{cockroach}	GTVLAGELSL MSALAAAGHLV KSHMRHNRSK VSTSG.....
HMGRclustalw{drosophila}	ATVMAGELSL MAALVNSDLV KSHMRHNRSK IAVNSAN...
HMGRclustalw{dictyostel}	SAVMAGELSL MSALSAGHLV KSHLQYNRAK TN.....
HMGRclustalw{schistosom}	GTVLAEELSL MAALDTDDLK KAHMHFNRAK OSTNSHSCSH
STTDNDNI	
HMGRclustalw{archaeoglo}	..GLAQNTAA LRALATEGIO RGHMEIHNRAK LAIMAGATGD
EVDVVIMV	
HMGRclustalw{pseudomonas}	..GLAQNLGA MRALATEGIO RGHMALHARN IAVVAGARGD
EVDVVARQLV	
Consensus	GTVLAGELSL MSALAAAGHLV KSHMK-NRSS KDVSK-----

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†††



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		LÖGCTK KSA.
S		SQVNR
A		SS
A		AS
A		AS
L		ES
A		TTTT TTT
A		TTTT
A		SS
A		SS
I		ASSQL ESDS
I		TF
I		S
T		TATEK TRÖREVDV
A		AS
OCPRALSVNN VDERRRYSEV KAIDE		
NRLKDGSV TCIKS		
NKGPPCKT SALT		

FIG. 32T

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